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WATER QUALITY SUMMARY  
for the  
INLAND LAKES of  
GREY and BRUCE COUNTIES

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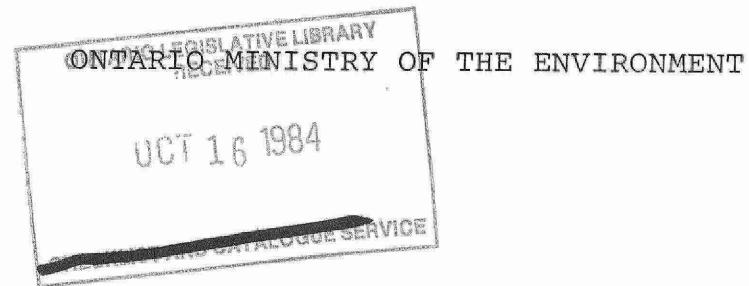
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Water Quality Summary for the  
Inland Lakes of Grey and Bruce Counties

Water Resources Assessment Unit  
Technical Support  
Southwestern Region

January, 1983

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### SUMMARY

The majority of inland lakes contained within the Southwestern Region of the Ministry of the Environment are found in Grey and Bruce counties. These lakes are small, shallow, hardwater lakes that are sensitive, primarily because of their size, to influences that affect their water quality. Little change has been noticed however in the productivity of these lakes as reflected through long-term monitoring of water clarity and phytoplankton from 1972 to 1981. Intermittently, however, their sensitivity has been demonstrated through peaks in phytoplankton growth which have resulted in documented blooms on twenty-five percent of the 28 lakes monitored. In addition, several lakes support extensive growths of rooted plants in the nearshore areas which have been a source of concern to users. Over the period of record, water quality has generally been good enough to support a variety of recreational uses.

### INTRODUCTION

The monitoring of the inland lakes of Grey and Bruce counties began on a regular basis in 1972 with the sampling of two lakes. This quickly increased to eight lakes in 1973 and reached 13 lakes at the time of a 1977 publication<sup>a</sup>. By 1981 the sampling program had increased to include 28 lakes on a regular basis (Table 1).

<sup>a</sup> "Enrichment Status of Owen Sound Bay, Tobermory Harbour and Thirteen Lakes in Grey and Bruce Counties 1975-1976." Ontario Ministry of the Environment.

Table 1. Inland lakes of Grey and Bruce counties monitored on a regular basis.

<u>No.</u>	<u>Name</u>	<u>Township, County</u>
1	Arran	Arran Township, Bruce County
2	Bass	Keppel Township, Grey County
3	Beattie	Albemarle Township, Bruce County
4	Bells	Glenelg Township, Grey County
5	Berford	Albemarle Township, Bruce County
6	Boat	Amabel Township, Bruce County
7	Brewster	Osprey Township, Grey County
8	Britain	Lindsay Township, Bruce County
9	Cameron	St. Edmunds Township, Bruce County
10	Chesley	Amabel Township, Bruce County
11	Cyprus	St. Edmunds Township, Bruce County
12	Eugenia	Artemesia Township, Grey County
13	Francis	Keppel Township, Grey County
14	Gillies	Lindsay Township, Bruce County
15	Gould	Amabel Township, Bruce County
16	Irish	Artemesia Township, Grey County
17	Isaac	Albemarle Township, Bruce County
18	McCullough	Sullivan Township, Grey County
19	McGill	Sydenham Township, Grey County
20	Miller	Lindsay Township, Bruce County
21	Mountain	Keppel Township, Grey County
22	Shephard	Keppel Township, Grey County
23	Shouldice	Lindsay Township, Bruce County
24	Silver	Amabel Township, Bruce County
25	Sky	Albemarle Township, Bruce County
26	Spry	Amabel Township, Bruce County
27	Wilcox	Artemesia Township, Grey County
28	Williams	Holland Township, Grey County

The main emphasis of the program was the monitoring of plant productivity in the lakes over time. Changes in water quality as reflected by changes in plant productivity signal the need for closer examination of a lake. Owing to a general uniformity of results indicating an absence of change in water quality over the ten year sampling period, the long-term monitoring program was temporarily stopped in 1981. It is the intention that lakes will be periodically re-sampled to see if the long-term trend is changing. In addition to the long-term monitoring, field investigations are conducted as the need arises, usually in response to a variety of water quality concerns. The program was conducted through the joint efforts of the North Grey-Sauble Valley Conservation Authorities and the Ontario Ministry of the Environment. The locations of the lakes are shown in Figure 1.

#### METHODS

The method used to document long-term water quality involved the surveillance of water clarity and plant (phytoplankton) productivity. Phytoplankton are free-floating microscopic plants (algae) that respond quickly to changes in water quality through changes in types and numbers. To collect phytoplankton it is first necessary to measure the depth of light penetration (water clarity) using a Secchi disc. The disc, having a diameter of 20 centimetres is divided into alternating black and white quadrants and is lowered into the water on a graduated line until the quadrants are no longer distinguishable. This depth is recorded and the disc is raised slowly until the quadrants are just distinguishable. This depth is also recorded and the average of the two readings is the Secchi disc depth (Figure 2). The depth to which light can penetrate in sufficient intensity to stimulate phytoplankton growth (the euphotic zone) is approximately twice the Secchi disc depth.

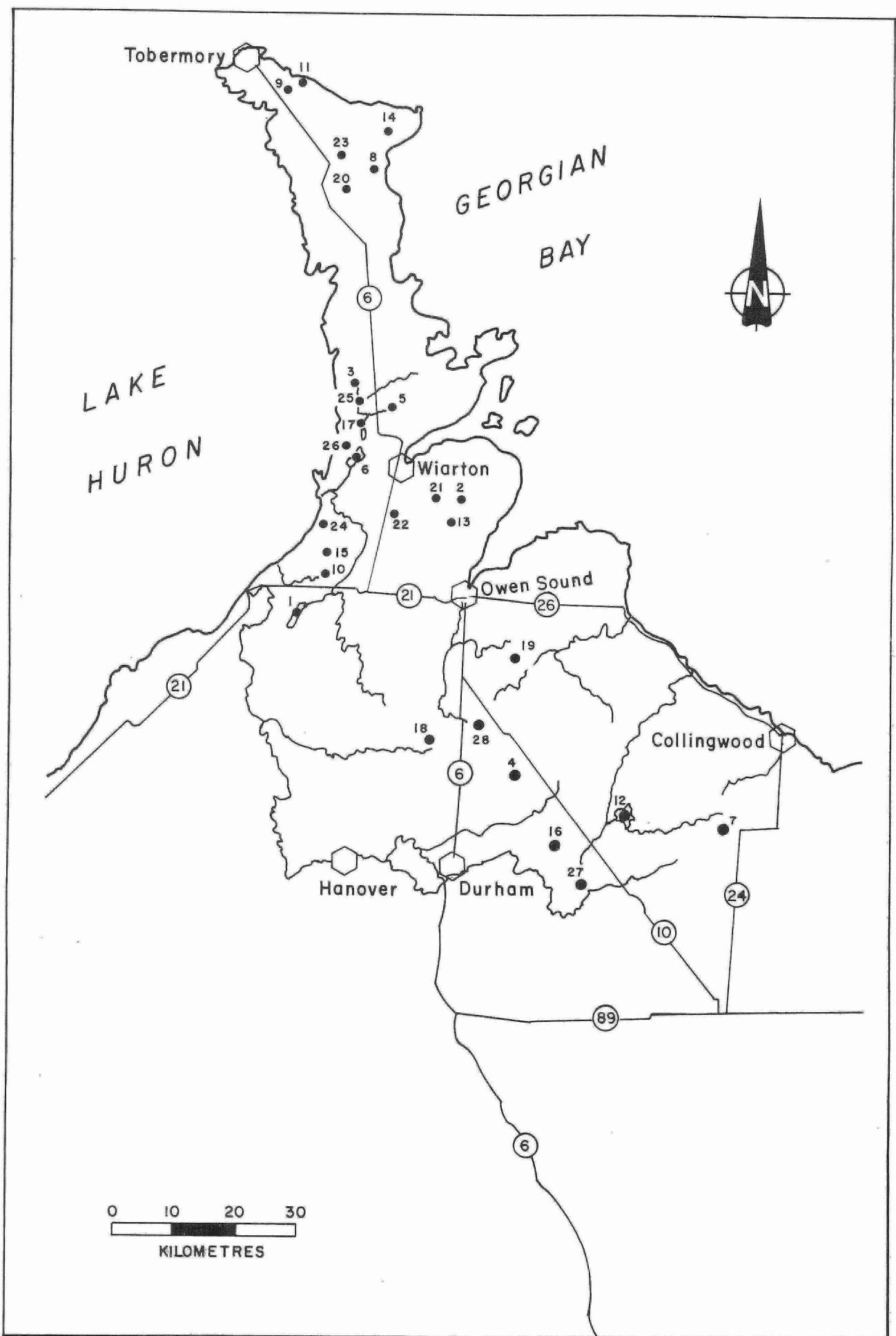


Figure 1. Locations of regularly monitored lakes.

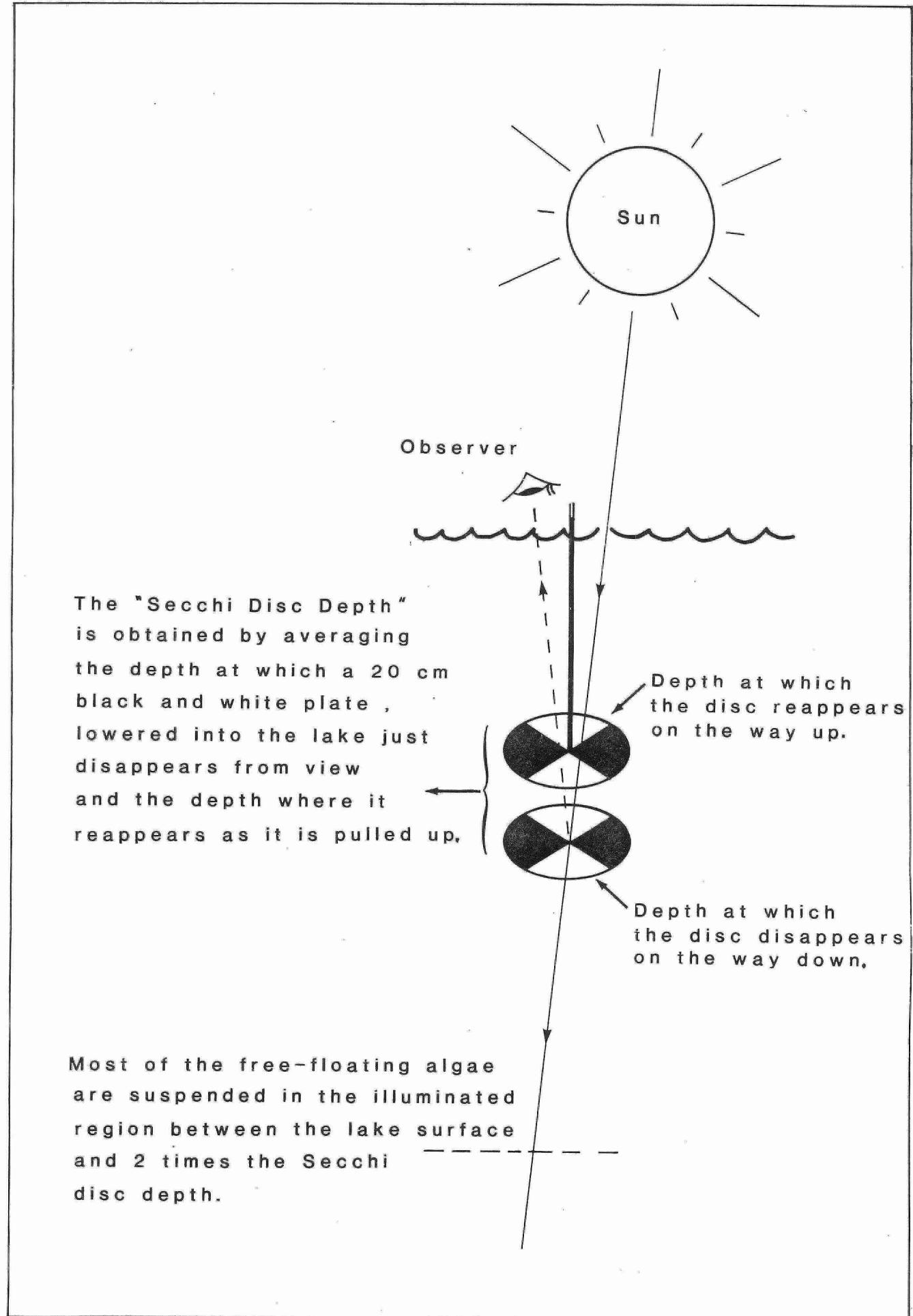


Figure 2. The use of a Secchi disc to measure water clarity.

Knowing the Secchi disc depth and consequently the depth to which algae can live (the euphotic zone), samples were collected through this zone. Samples collected for chlorophyll a analysis (1972 to 1981) were preserved with 1 ml of 0.5% magnesium carbonate while samples collected for phytoplankton analysis (1977 to 1981) were preserved with Lugols iodine (7 drops). All analyses were carried out at the Toronto laboratory of the Ministry of the Environment.

In addition to measuring water clarity and plant productivity, lake water chemistry was also analysed. Oxygen and temperature readings were obtained from just below the surface and from just off the bottom at the deepest spot in a lake using a Hach kit. If a lake contained more than one basin then oxygen and temperature were evaluated in each basin. If it was determined that thermal stratification was occurring then an oxygen-temperature profile was completed and a water sample was collected for chemical analysis from both the top and bottom waters. If a lake was homothermous then a single water sample was collected at mid-depth in the lake basin(s). Samples for chemical analysis were collected over the three-year period from 1977 to 1979 to establish baseline water chemistry.

All of the aforementioned samplings were conducted approximately every two weeks from May through August.

#### RESULTS AND CONCLUSIONS

Results for annual average chlorophyll a concentrations - Secchi disc depths and phytoplankton cell volumes are listed in tables 2 and 3 respectively. In addition, graphs displaying chlorophyll a - Secchi disc relationships, histograms displaying phytoplankton cell

TABLE 2. Annual average chlorophyll a - Secchi disc results for 1978 to 1981.

LAKE	1978		1979		1980		1981	
	Chl.a	Secchi depth	Chl.a	Secchi depth	Chl.a	Secchi depth	Chl.a	Secchi depth
	(ug/l)	(m)	(ug/l)	(m)	(ug/l)	(m)	(ug/l)	(m)
1) Arran	2.0	2.2	1.8	2.2	2.5	1.8	1.7	3.0
2) Bass	1.3	2.4	2.0	2.1	1.3	3.6	1.2	3.0
3) Beattie	1.6	1.7	1.1	1.5	1.4	1.5	2.4	2.0
4) Bells	1.3	4.1	1.9	3.5	1.9	3.1	1.6	3.3
5) Berford	1.7	3.5	2.0	3.3	1.5	4.4	1.7	3.0
6) Boat	1.7	2.0	1.9	1.8	2.2	1.5	2.1	1.7
7) Brewster	1.4	6.3	1.7	6.0	1.6	6.1	1.9	4.0
8) Britain	1.3	2.1	2.4	2.1	2.6	2.2	2.2	2.0
9) Cameron	1.2	3.1	1.8	2.1	1.2	3.3	1.4	2.3
10) Chesley	3.7	2.3	2.4	3.7	2.8	4.1	1.8	2.9
11) Cyprus	2.1	2.9	1.6	2.0	1.4	2.4	1.3	2.1
12) Eugenia	2.6	4.0	2.3	3.4	2.6	4.2	2.6	3.0
13) Francis	0.5	2.4	1.2	2.6	1.4	3.3	1.5	2.4
14) Gillies	0.9	5.6	1.0	4.6	1.0	6.9	0.9	5.4
15) Gould	2.4	3.5	2.8	2.7	2.3	3.4	2.2	2.7
16) Irish	--	--	1.5	3.4	2.6	4.9	2.5	2.9
17) Issac	1.7	1.6	1.4	1.5	1.8	1.2	2.1	1.7
18) McCullough	1.3	4.0	1.8	3.6	1.5	4.4	1.7	3.6
19) McGill	--	--	2.7	2.1	3.7	3.1	2.6	2.4
20) Miller	2.3	2.9	2.5	1.8	2.1	2.7	2.0	2.4
21) Mountain	1.3	1.7	1.9	1.7	2.5	1.6	1.5	1.7
22) Shephard	--	--	0.7	4.8	1.6	1.4	2.1	1.6
23) Shouldice	0.9	2.2	3.7	1.7	1.0	2.0	1.1	2.3
24) Silver	1.1	1.7	1.9	1.5	1.5	1.2	1.3	1.6
25) Sky	1.8	1.6	1.8	1.7	1.8	1.7	1.5	1.5
26) Spry	2.5	1.8	2.8	2.4	2.2	2.1	1.7	1.9
27) Wilcox	2.9	4.0	2.5	2.9	3.1	3.6	3.2	2.3
28) Williams	--	--	1.1	1.9	0.7	3.8	0.6	3.0

TABLE 3. Annual average phytoplankton results for 1977 to 1981.

LAKE	CELL VOLUME mm <sup>3</sup> /l				
	1977	1978	1979	1980	1981
1) Arran	.708	1.293	1.003	1.080	.375
2) Bass	.299	.809	.367	.958	.037
3) Beattie	.790	.679	.332	.589	.434
4) Bells	--	.690	.476	.509	.240
5) Berford	.950	.927	.850	.518	.739
6) Boat	.178	1.455	.794	.530	.433
7) Brewster	--	.478	.661	.680	.447
8) Britain	--	--	.675	.944	.327
9) Cameron	.495	.604	.880	.640	.408
10) Chesley	.612	1.976	.675	.772	.239
11) Cyprus	.550	1.207	.667	.997	.121
12) Eugenia	.227	.827	.934	1.905	.363
13) Francis	--	.458	.427	1.491	.269
14) Gillies	.216	.465	.202	.308	.114
15) Gould	.391	1.368	1.405	1.258	.483
16) Irish	.631	--	.381	.753	.522
17) Issac	.309	.574	.230	.219	.094
18) McCullough	.501	.487	.542	.390	.250
19) McGill	--	--	.378	.897	.178
20) Miller	.592	4.153	1.066	2.276	.569
21) Mountain	--	2.471	.567	1.062	.390
22) Shephard	--	--	--	1.099	.257
23) Shouldice	.681	.681	1.687	.376	.189
24) Silver	.265	.632	.725	.419	.107
25) Sky	.285	.459	.519	.586	.136
26) Spry	.620	.939	.695	1.194	.329
27) Wilcox	--	1.073	1.120	1.436	.296
28) Williams	.075	.226	.140	.171	.085

volumes and tables showing water chemistry are summarized for each of the 28 lakes in the Appendix. Chlorophyll a data for 1977 has been deleted because of analytical uncertainty.

The chlorophyll a - Secchi disc curves indicate that the lakes were relatively unproductive with regard to phytoplankton. To illustrate this, data points are individually displayed for each lake in relation to a curve which was derived from data collected from more productive lakes in the Kawartha Lakes district. The majority of lakes in Grey and Bruce counties had an annual average chlorophyll a concentration between 1 and 2.5 ug/l. Britain, Eugenia, Gould, Irish, and Spry lakes had annual averages which ranged as high as 2.6 to 3 ug/l, while Chesley, McGill, Shouldice and Wilcox lakes had averages between 3 and 4 ug/l.

Similarly, the phytoplankton cell volumes were also very low. As a general rule, the following categories may be applied to interpret phytoplankton cell volumes.

<u>Cell Volume (mm<sup>3</sup>/l)</u>	<u>Degree of Productivity</u>
L1	low
1-3	moderate
G3	high

L = Less Than

G = Greater Than

During 1977 and 1981, no lake exceeded an average annual cell volume of 1 mm<sup>3</sup>/l, thus indicating years of moderate productivity. For the years from 1978 to 1980, Arran, Gould Miller and Wilcox lakes had volumes consistently above 1 mm<sup>3</sup>/l. Sixteen of the remaining 24 lakes remained less than 1 mm<sup>3</sup>/l and the other 8 had yearly

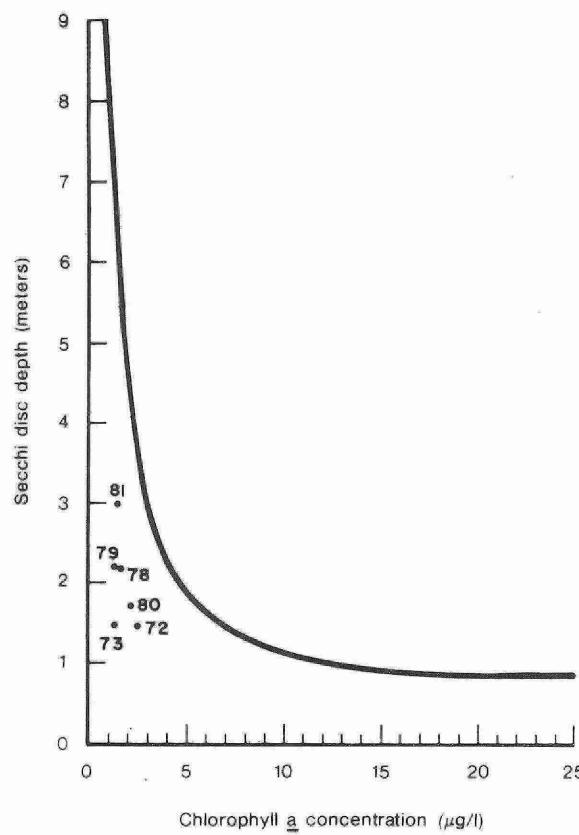
fluctuations above 1 mm<sup>3</sup>/l, indicating years of moderate productivity. Miller lake was the only lake that had a high degree of productivity (4.153 mm<sup>3</sup>/l) which occurred during the summer of 1978.

Despite low annual averages, which reflect a generally acceptable level of productivity, peaks in productivity called "blooms" can occur. Known blooms have occurred in Berford, Chesley, Bass, Eugenia, Gould, Miller and Wilcox lakes.

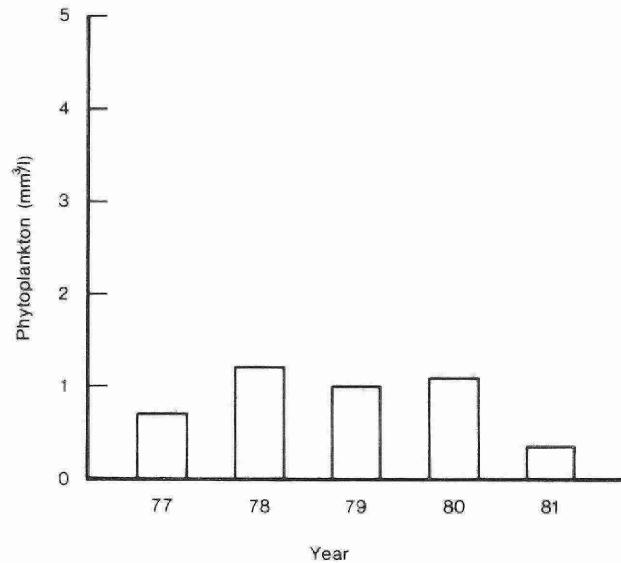
Because of the physical nature of the lakes, much of the plant productivity is in plant forms other than phytoplankton. Typically these other types of plants are rooted plants, diatom scums and/or beds of the alga, Chara. Heavy growths of rooted plants in the nearshore areas have been a source of particular concern to users of Eugenia, Wilcox and Chesley lakes.

The water chemistry data show the lakes to be hardwater lakes with high alkalinites, which reflects their location in the calcareous bedrock of the Niagara Escarpment. Most of the hardness is in the form of calcium carbonate which encrusts the aquatic plants and deposits on the bottom as marl. In general, the hardness ranges between 100 and 200 mg/l (as CaCO<sub>3</sub>). Several lakes, Bass, Bells, Eugenia, McCullough, Shephard and Williams, have a hardness in excess of 200 mg/l. Phosphorus concentrations were generally quite low over the period of measurement from May through August. Enough phosphorus is present however to support aquatic plant growth and along with ammonia showed a tendency in some stratified lakes to be higher in bottom waters. An increase of ammonia and phosphorus can be indicative of deteriorating water quality however no obvious relationship was demonstrated for these lakes.

APPENDIX



Chlorophyll a-Secchi disc curve.



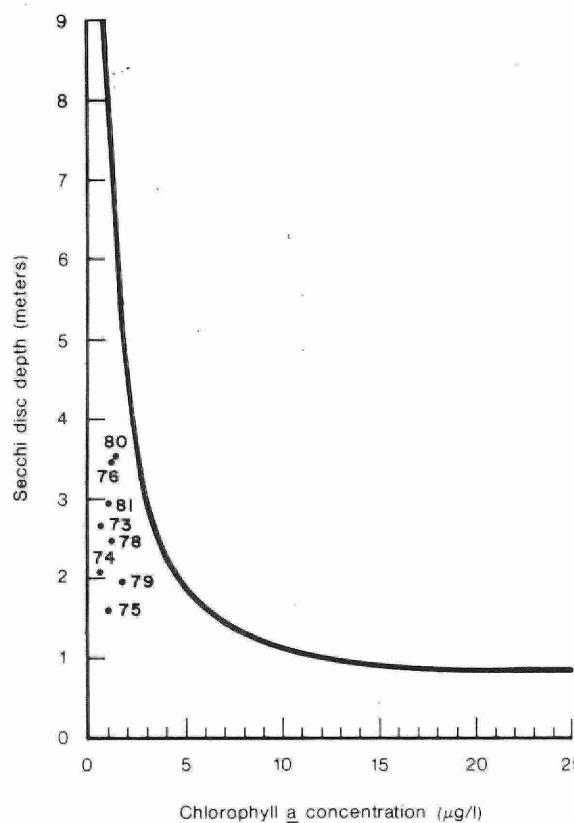
Phytoplankton cell volumes.

Average values for water quality parameters

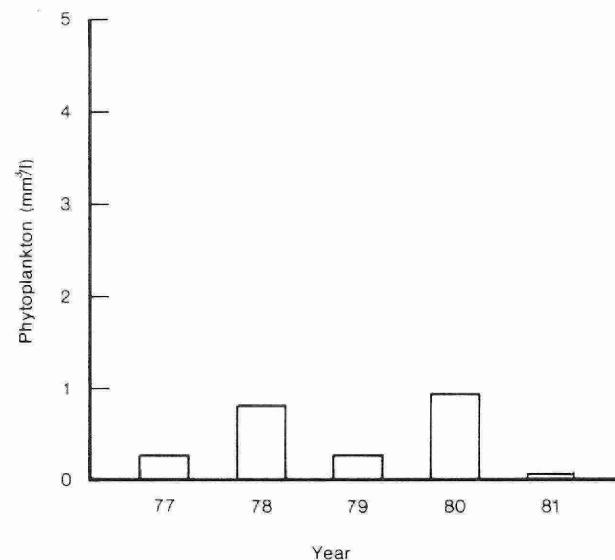
Year	Secchi disc (m)	Chlorophyll a (ug/l)	Phytoplankton volume (mm³/l)	Total Phosphorus	Soluble Phosphorus	Chloride as Cl	Hardness as CaCO <sub>3</sub>
1977	0.8	--	0.708	0.014	0.003	3.9	140
1978	2.2	2.0	1.293	0.015	0.004	4.0	151
1979	2.2	1.8	1.003	0.011	0.002	4.2	139
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total Solids	Suspended Solids
1977	0.039	0.552	0.003	0.02	8.45	--	--
1978	0.039	0.528	0.002	<0.01	8.45	178	2.7
1979	0.033	0.510	0.001	<0.01	8.50	162	5.0
Year	Alkalinity as CaCO <sub>3</sub>	Turbidity FTU**	Iron	Calcium	Sodium	Magnesium	
1977	113	--	0.052	--	--	--	
1978	147	1.02	0.05	38.5	2.2	14.0	
1979	126	--	0.11	31.5	2.3	14.7	

\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

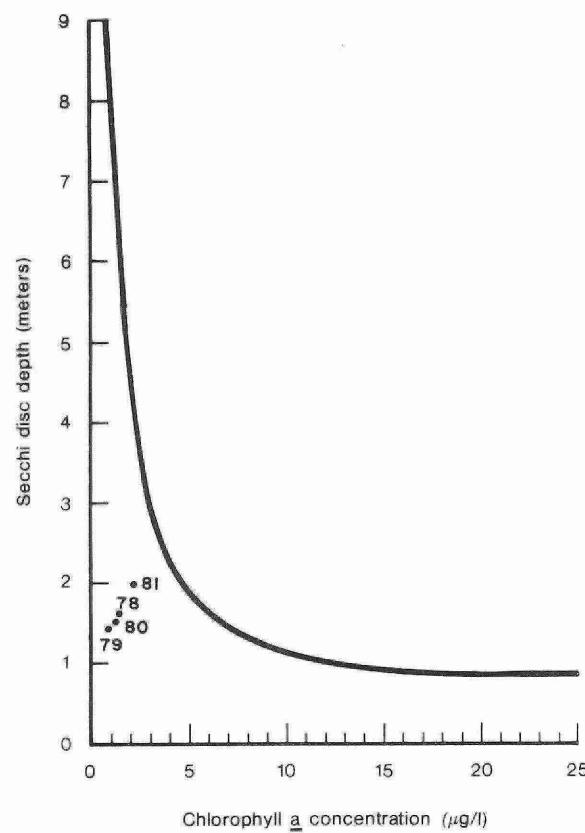
Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a (ug/l)	Phytoplankton volume (mm³/l)	Total Phosphorus	Soluble Phosphorus	Chloride as Cl	Hardness as CaCO <sub>3</sub>
1977	T 3.4	--	0.299	0.007	0.001	2.86	188.3
	B	--		0.084	0.006	9.27	238.5
1978	T 2.4	1.5	0.809	0.010	0.002	2.6	205
	B	--		0.062	0.004	4.0	197
1979	T 2.1	2.0	0.367	0.007	0.001	3.1	178
	B	--		0.041	0.009	3.8	208
Nitrogen				pH		Solids	
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	(no units)	Total	Suspended
1977	0.015	0.4168	0.002	0.021	8.37	--	--
	1.52	2.37	0.006	0.019	7.55		
1978	0.02	0.29	0.75	0.43	8.29	204	1.0
	0.468	1.09	0.006	0.28	7.92		
1979	0.011	0.25	0.002	0.07	8.48	202	5.0
	0.615	1.1	0.007	0.08	7.77		
Alkalinity as CaCO <sub>3</sub>		Turbidity FTU**		Iron	Calcium	Sodium	Magnesium
1977	174.3	--	--	0.028	--	--	--
	235.2	--	--	0.175			
1978	193	2.73	0.034	42.5	1.3	23.9	
	194	3.17	0.24	42.8	2.5	20.0	
1979	170	--	0.03	34.8	1.6	24.4	
	200	--	0.12	45.7	1.8	24.9	

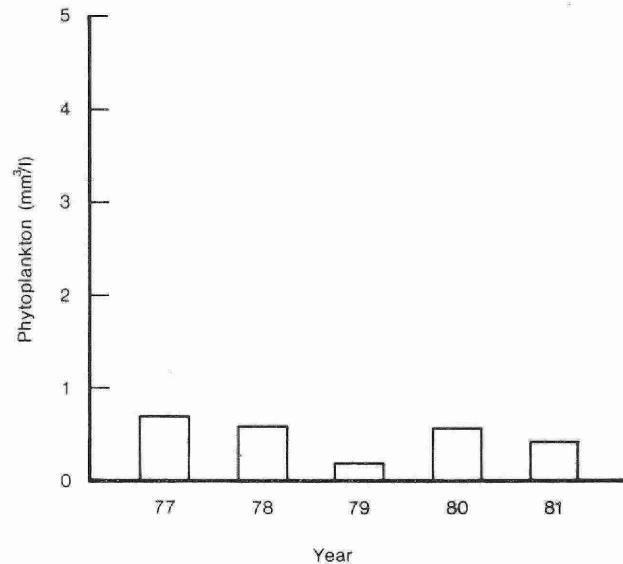
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

### 3. BEATTIE LAKE



Chlorophyll a-Secchi disc curve.



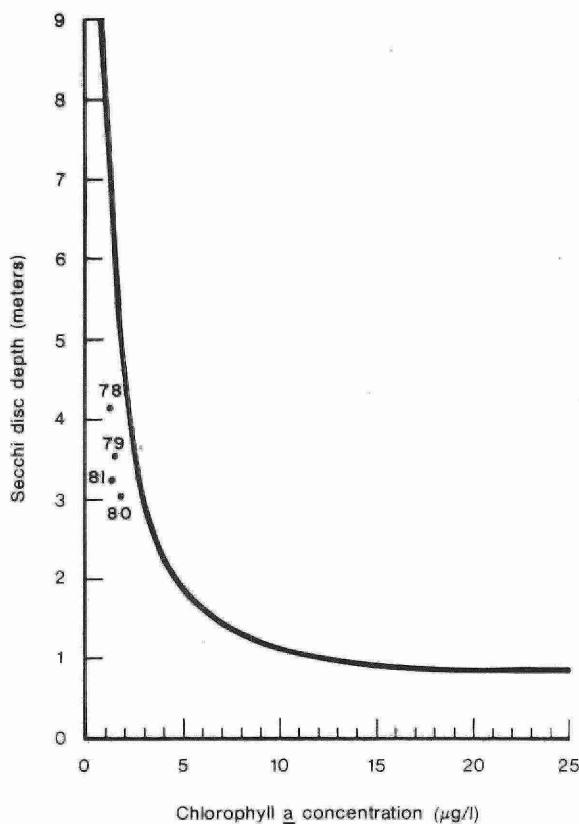
Phytoplankton cell volumes.

#### Average values for water quality parameters

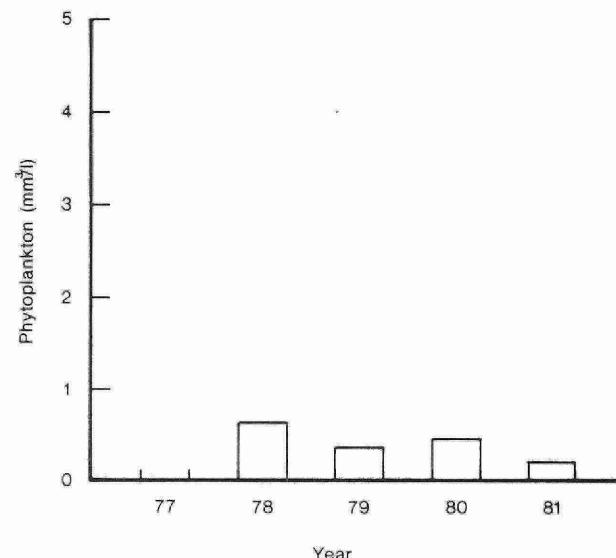
Year	Secchi disc (m)	Chlorophyll a (ug/l)	Phytoplankton volume (mm³/l)	Total Phosphorus	Soluble Phosphorus	Chloride as Cl	Hardness as CaCO <sub>3</sub>
1977	--	--	0.780	--	--	--	--
1978	1.7	1.6	0.679	0.012	0.003	1.6	151
1979	1.5	1.1	0.332	0.016	0.001	2.3	145
<hr/>							
Year	Nitrogen			pH		Solids	
	Free ammonia	Kjeldahl	Nitrite	Nitrate	(no units)	Total	Suspended
1977	--	--	--	--	--	--	--
1978	0.033	0.538	0.003	0.015	--	167	3.5
1979	0.034	0.52	0.001	0.03	8.58	167	< 5.0
Year	Alkalinity as CaCO <sub>3</sub>		Turbidity FTU**	Iron	Calcium	Sodium	Magnesium
	--	--	--	--	--	--	--
1977	--	--	--	--	--	--	--
1978	--	0.7	0.04	33.8	0.73	17.2	
1979	127	--	0.08	26.8	0.7	19.0	

\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units



Chlorophyll a-Secchi disc curve.



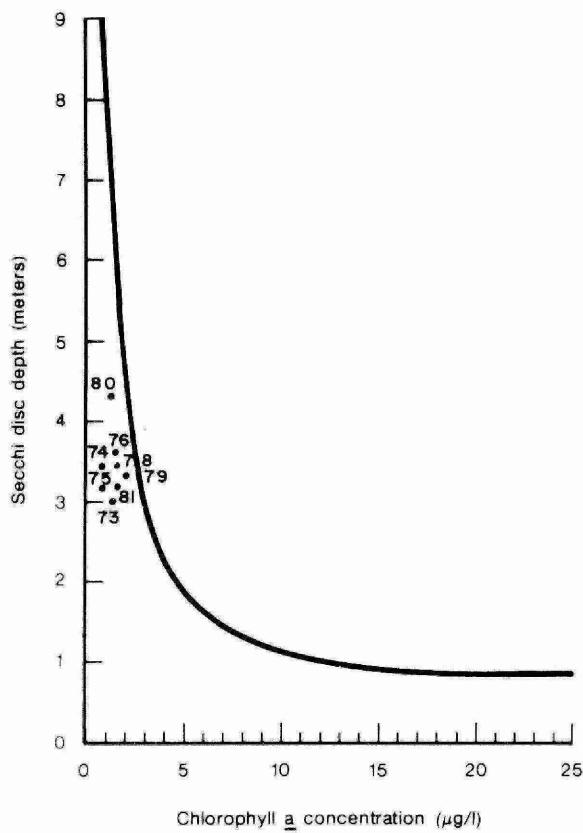
Phytoplankton cell volumes.

Average values for water quality parameters

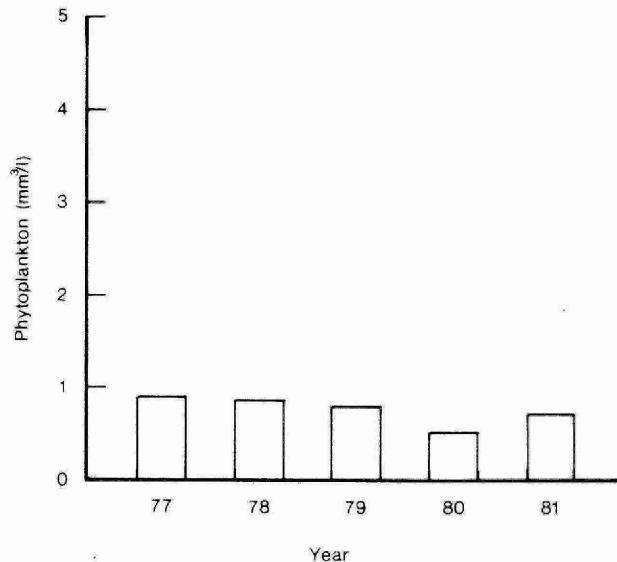
Year	Secchi disc (m)	Chlorophyll a ( $\mu\text{g/l}$ )	Phytoplankton volume ( $\text{mm}^3/\text{l}$ )	Total Phosphorus	Soluble Phosphorus	Chloride as $\text{Cl}$	Hardness as $\text{CaCO}_3$
1977 T	--	--	--	--	--	--	--
B	--	--	--	--	--	--	--
1978 T	4.1	1.4	0.690	0.004	0.001	5.2	213
B				0.007	0.001	4.6	216
1979 T	3.5	2.0	0.476	0.010	0.002	6.0	215
B				0.012	0.003	5.2	219
Year	Nitrogen				pH (no units)	Solids	
	Free ammonia	Kjeldahl	Nitrite	Nitrate		Total	Suspended
1977 T	--	--	--	--	--	--	--
B	--	--	--	--	--	--	--
1978 T	0.038	0.353	0.004	0.008	8.32	214	2.1
B	0.046	0.388	0.004	0.009	8.25		
1979 T	0.024	0.37	0.002	0.03	8.38	246	< 5.0
B	0.119	0.44	0.002	0.04	8.05	241	< 5.0
Year	Alkalinity as $\text{CaCO}_3$	Turbidity			Iron	Calcium	Sodium
		FTU**					Magnesium
1977 T	--	--	--	--	--	--	--
B	--	--	--	--	--	--	--
1978 T	205	0.66	0.04	46.8	2.9	23.2	
B	203	0.72	0.05	48.1	2.8	23.1	
1979 T	199	--	0.07	44.4	3.5	25.3	
B	202		0.05	46.5	3.1	24.9	

\*Note - All values in  $\text{mg/l}$  except where otherwise indicated

\*\*Formazin Turbidity Units



## 5. BERFORD LAKE

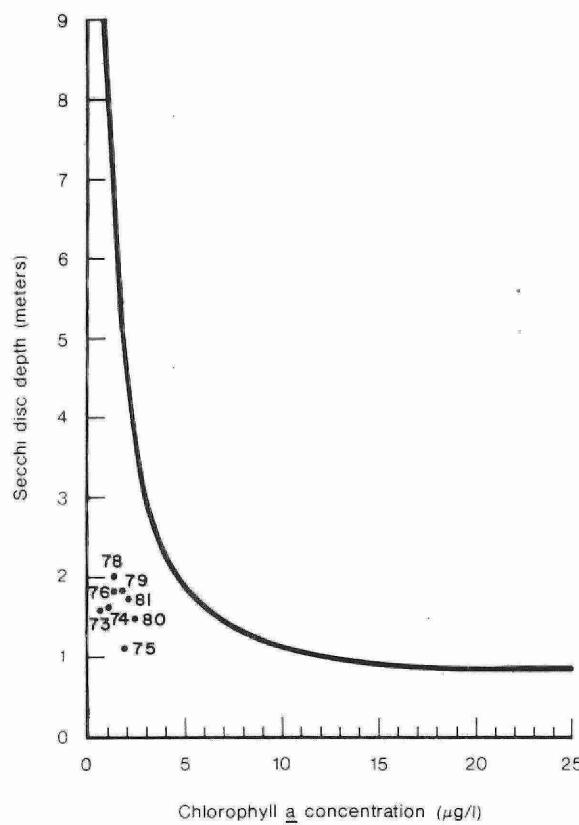


### Average values for water quality parameters

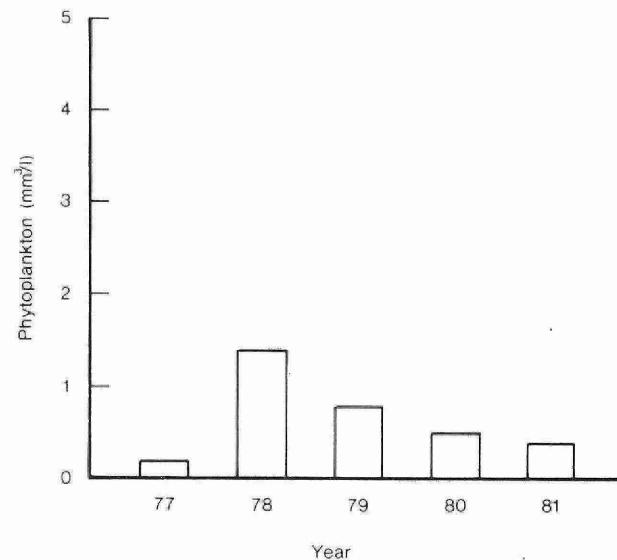
Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a ( $\mu\text{g/l}$ )	volume ( $\text{mm}^3/\text{l}$ )	Total	Soluble	as Cl	as $\text{CaCO}_3$
1977	T	3.7	—	0.010	0.002	2.39	141.8
	B	—	0.950	0.010	0.002	2.36	143.6
1978	T	3.5	1.7	0.005	0.002	2.3	164.3
	B	—	0.927	0.006	0.002	2.3	164.3
1979	T	3.3	2.0	0.010	0.001	2.3	143
	B	—	0.850	0.009	0.001	2.2	144
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total	Solids
1977	T	0.036	0.567	0.001	0.013	8.49	—
	B	0.036	0.615	0.001	0.011	8.52	—
1978	T	0.04	0.494	0.002	0.02	8.39	153
	B	0.04	0.511	0.002	0.02	8.41	159
1979	T	0.022	0.464	0.001	< 0.01	8.60	169
	B	0.027	0.484	0.001	< 0.01	8.61	170
Alkalinity							
Year	as $\text{CaCO}_3$	Turbidity	Iron	Calcium	Sodium	Magnesium	
1977	T	123.5	—	0.036	—	—	—
	B	123.7	—	0.063	—	—	—
1978	T	158	0.90	0.06	38.0	0.8	16.8
	B	156	1.30	0.05	38.0	0.8	16.8
1979	T	129	—	0.03	28.7	0.9	17.4
	B	129	—	0.03	28.8	0.9	17.5

\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units



## 6. BOAT LAKE



Chlorophyll a-Secchi disc curve.

Phytoplankton cell volumes.

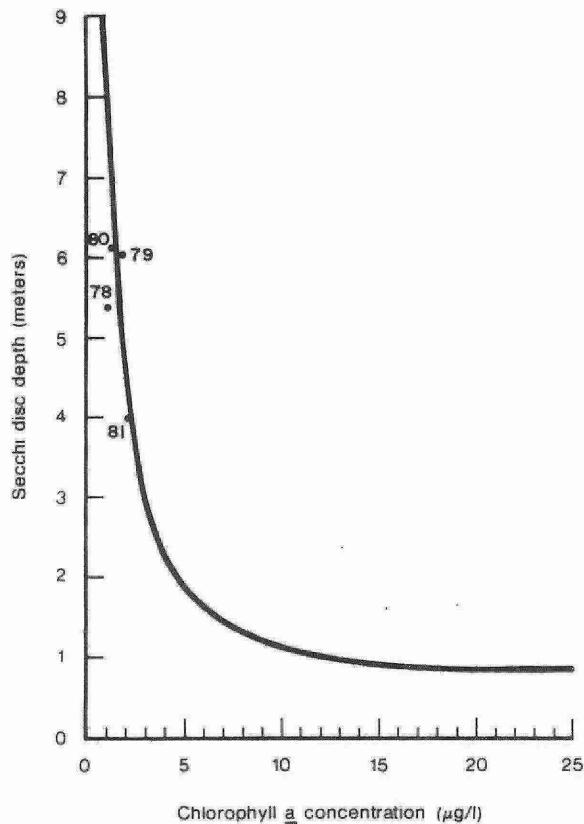
### Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	1.1	--	0.178	0.012	0.002	3.75	155.3
1978	2.0	1.7	1.455	0.009	0.002	1.5	164
1979	1.8	1.9	0.794	0.017	0.001	4.3	174
Year	Nitrogen				pH	Solids	
	Free ammonia	Kjeldahl	Nitrite	Nitrate	(no units)	Total	Suspended
1977	0.021	0.473	0.003	0.01	8.47	--	--
1978	0.029	0.489	0.001	0.01	8.29	394	3.8
1979	0.028	0.53	0.001	< 0.01	8.48	199	< 5.0
Year	Alkalinity	Turbidity		Iron	Calcium	Sodium	Magnesium
	as CaCO <sub>3</sub>	FTU**					
1977	146.5	--		0.058	--	--	--
1978	155	0.95		0.08	39.0	1.6	16.1
1979	158	--		0.06	37.2	2.1	19.6

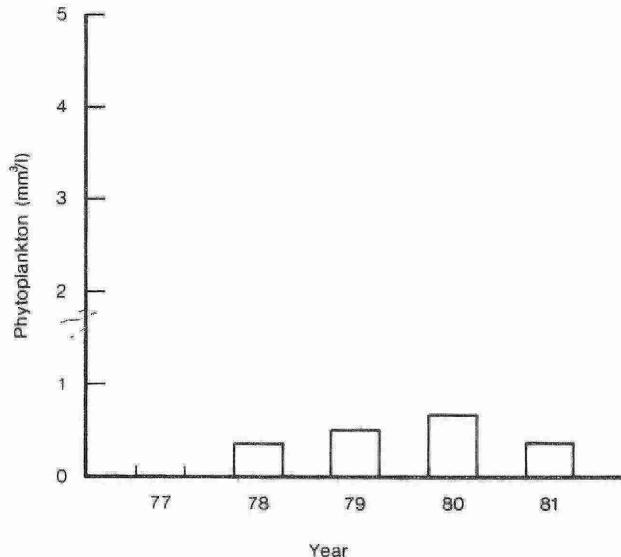
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

7. BREWSTER LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

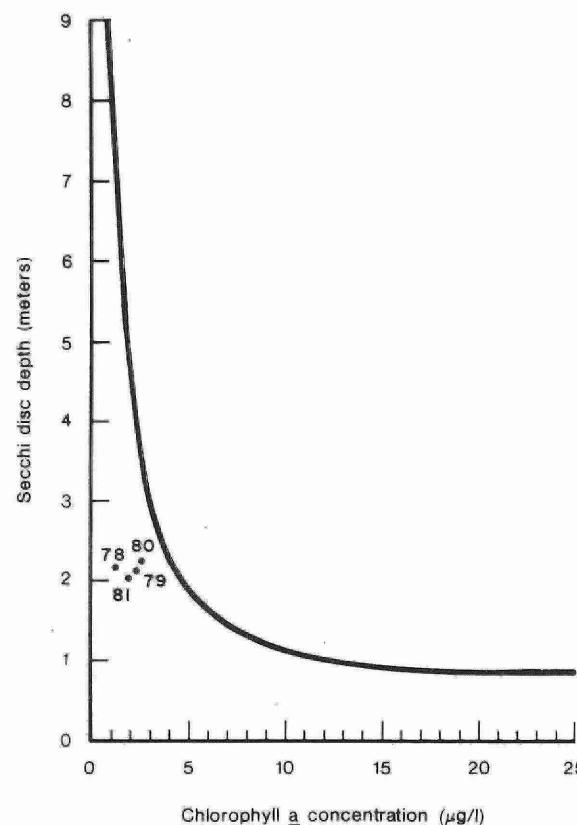
Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	T	--	--	--	--	--	--
	B	--	--	--	--	--	--
1978	T	5.4	1.2	0.478	0.006	0.002	2.3
	B	--	--	--	0.008	0.001	2.1
1979	T	6.0	1.6	0.661	0.007	0.002	2.9
	B	--	--	--	0.010	0.001	2.5
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total	Solids
	--	--	--	--	--	--	--
1977	T	--	--	--	--	--	--
	B	--	--	--	--	--	--
1978	T	0.063	0.374	0.048	0.29	8.35	159
	B	0.119	0.444	0.049	0.26	8.39	180
1979	T	0.059	0.437	0.007	0.14	8.45	194
	B	0.332	0.658	0.010	0.08	7.98	171
Alkalinity							
Year	as CaCO <sub>3</sub>	Turbidity	Iron	Calcium	Sodium	Magnesium	
	--	FTU**	--	--	--	--	
1977	T	--	--	--	--	--	
	B	--	--	--	--	--	
1978	T	136	0.52	0.04	36	0.9	15.0
	B	137	0.77	0.06	35	0.9	15.3
1979	T	143	--	0.02	44.6	1.1	17.7
	B	148	--	0.07	48.4	1.0	18.3

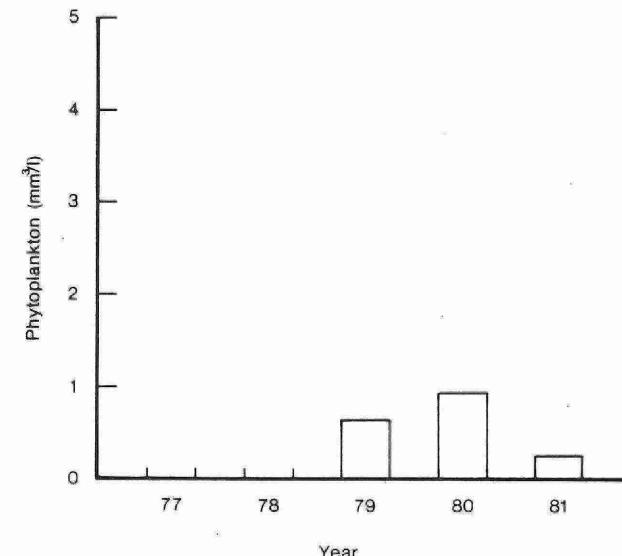
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

8. BRITAIN LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

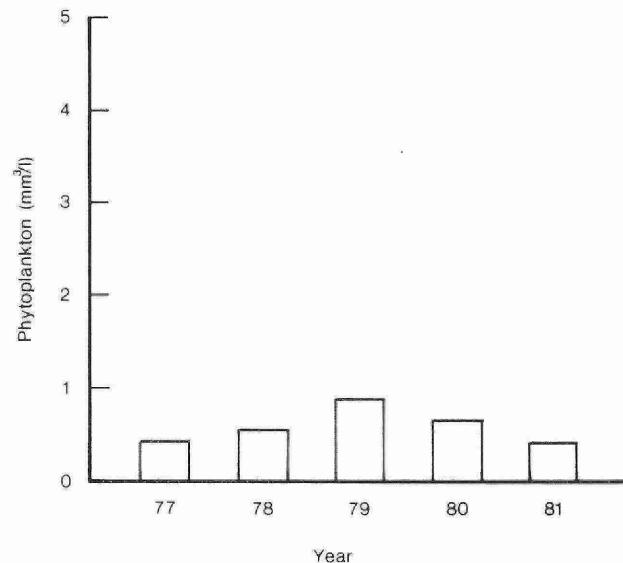
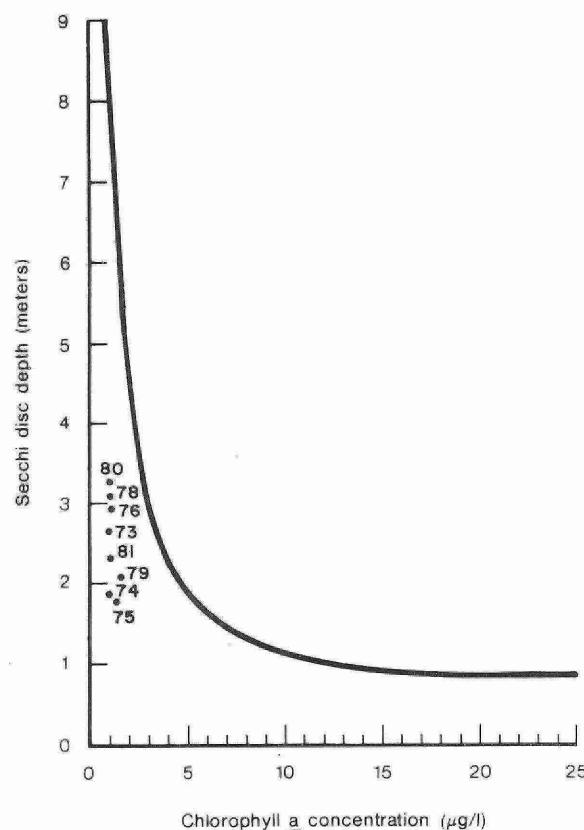
Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a ( $\mu\text{g/l}$ )	Phytoplankton volume ( $\text{mm}^3/\text{l}$ )	Total Phosphorus	Soluble Phosphorus	Chloride as Cl	Hardness as $\text{CaCO}_3$
1977	--	--	--	--	--	--	--
1978	2.1	1.3	--	0.010	0.001	1.0	10
1979	2.1	2.4	0.675	0.010	0.002	1.0	139
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total Solids	Suspended
1977	--	--	--	--	--	--	--
1978	0.045	0.39	0.001	< 0.01	9.2	--	--
1979	0.035	0.46	0.001	0.01	8.46	157	< 5.0
Alkalinity							
Year	as $\text{CaCO}_3$	Turbidity FTU**	Iron	Calcium	Sodium	Magnesium	
1977	--	--	--	--	--	--	--
1978	8.0	1.1	0.05	--	--	--	--
1979	124	--	0.08	30.6	0.4	15.3	

\*Note - All values in  $\text{mg/l}$  except where otherwise indicated

\*\*Formazin Turbidity Units

9. CAMERON LAKE



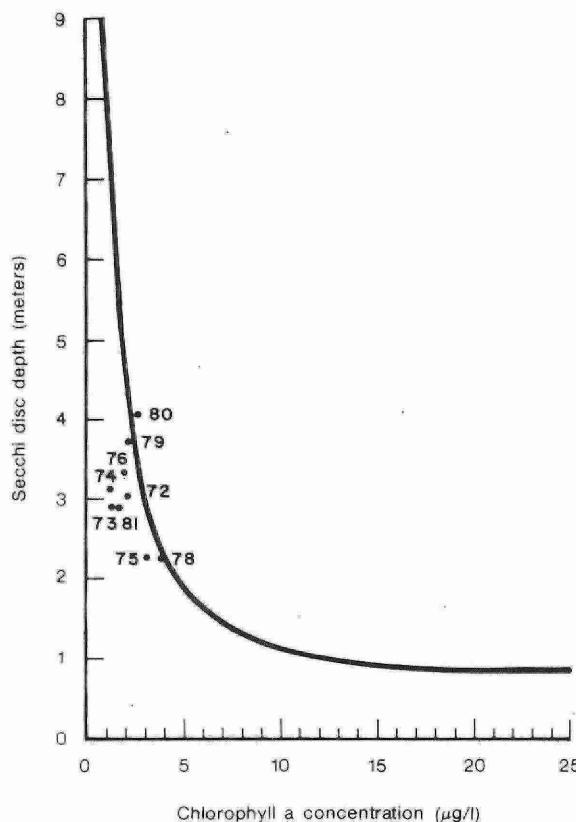
Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	T	2.5	--	0.007	0.002	1.4	178.6
	B	--	0.495	0.015	0.002	1.2	181.1
1978	T	3.1	1.2	0.007	0.001	1.6	212
	B	--	0.604	0.016	0.002	1.5	188
1979	T	2.1	1.8	0.006	0.001	1.8	187
	B	--	0.880	0.007	0.002	1.8	187
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total	Solids
	0.019	0.402	0.002	0.076	8.39	--	--
1977	B	0.122	0.593	0.002	8.11	--	--
	T	0.017	0.303	0.003	8.61	214	2.5
1978	B	0.071	0.475	0.005	8.62	--	--
	T	0.014	0.30	0.001	8.45	207	5.0
1979	B	0.068	0.39	0.002	8.26	205	5.0
Alkalinity							
Year	as CaCO <sub>3</sub>	Turbidity	Iron	Calcium	Sodium	Magnesium	
	--	FTU**	0.039	--	--	--	
1977	T	161.6	--	0.121	--	--	--
	B	166.4	--	--	--	--	--
1978	T	165	1.5	0.15	49.6	9.6	19.1
	B	166	4.0	0.07	40.0	0.5	21.7
1979	T	167	--	0.04	39.0	0.6	21.8
	B	168	--	0.08	39.5	0.7	21.3

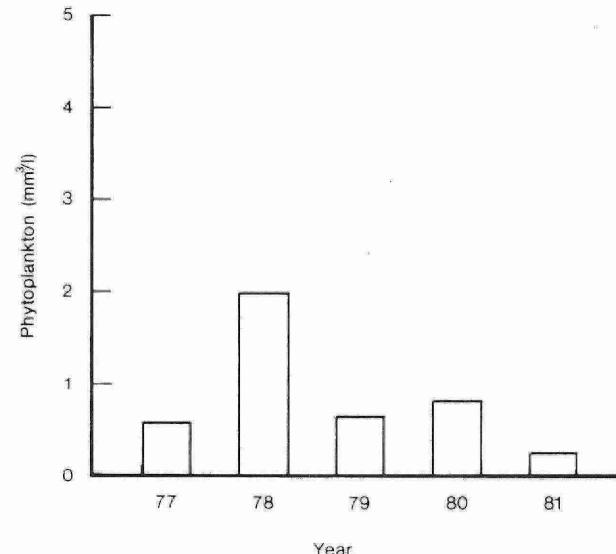
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

10. CHESLEY LAKE



Chlorophyll a—Secchi disc curve.



Phytoplankton cell volumes.

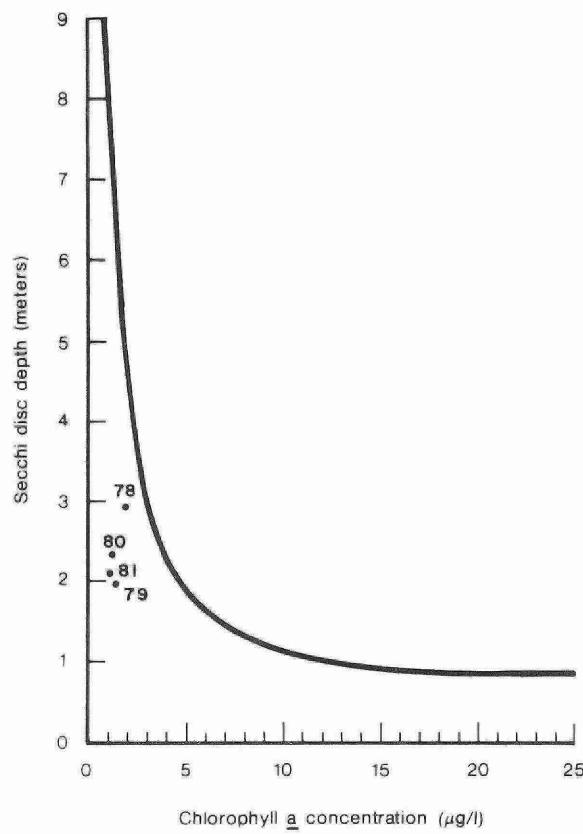
Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	T	3.4	0.612	0.013	0.002	6.02	135.1
	B	--		0.038	0.006	6.06	151.7
1978	T	2.3	1.976	0.016	0.004	5.3	150.6
	B	3.7		0.033	0.04	5.3	152.8
1979	T	3.7	0.675	0.012	0.003	5.3	144
	B	2.4		0.055	0.014	5.4	161
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total	Solids
1977	0.016	0.469	0.001	0.021	8.37	--	--
	0.353	0.818	0.003	0.026	7.61	--	--
1978	T	0.016	0.75	0.001	< 0.01	8.50	180
	B	0.129	0.656	0.002	< 0.01	8.48	186
1979	T	0.024	0.38	0.001	0.01	8.27	169
	B	0.369	0.76	0.002	0.01	7.57	192
Alkalinity							
Year	as CaCO <sub>3</sub>	Turbidity	Iron	Calcium	Sodium	Magnesium	
1977	119.2	FTU**	0.033	--	--	--	
	139.7		0.575	--	--	--	
1978	T	143	1.1	0.07	37.0	2.7	14.1
	B	142	3.0	0.18	38.2	2.7	13.9
1979	T	126	--	0.03	35.1	2.8	14.5
	B	147		0.62	40.5	2.8	14.5

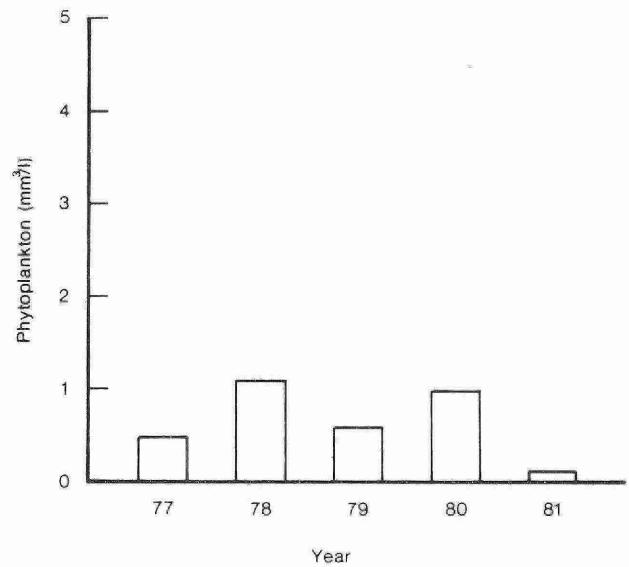
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

### 11. CYPRUS LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

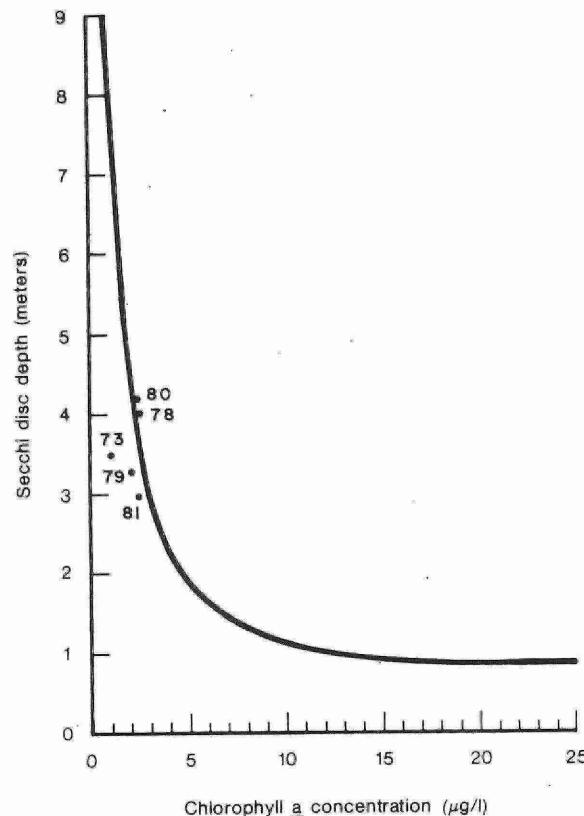
#### Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	T	2.8	--	0.008	0.002	2.0	173.3
	B	--	0.550	0.018	0.002	2.13	172.0
1978	T	2.9	2.1	1.207	0.005	0.002	2.1
	B	--	--	0.006	0.002	2.2	183
1979	T	2.0	1.6	0.667	0.006	0.002	2.2
	B	--	--	0.011	0.002	2.2	183
Year	Nitrogen				pH	Solids	
	Free ammonia	Kjeldahl	Nitrite	Nitrate	(no units)	Total	Suspended
1977	T	0.02	0.423	0.002	0.045	8.32	--
	B	0.024	0.543	0.002	0.045	8.29	--
1978	T	0.015	0.319	0.003	0.04	8.27	--
	B	0.015	0.335	0.002	0.04	8.60	219
1979	T	0.024	0.34	0.002	0.01	8.47	196
	B	0.039	0.36	0.001	0.02	8.35	191
Year	Alkalinity	Turbidity		Iron	Calcium	Sodium	Magnesium
	as CaCO <sub>3</sub>	FTU**	FTU**	Iron	Calcium	Sodium	Magnesium
1977	T	154.3	--	0.04	--	--	--
	B	159	--	0.10	--	--	--
1978	T	163	2.13	0.03	39.5	0.4	19.2
	B	162	2.13	0.03	39.8	0.5	18.4
1979	T	161	--	0.04	38.1	0.8	21.1
	B	163	--	0.05	38.4	0.7	21.1

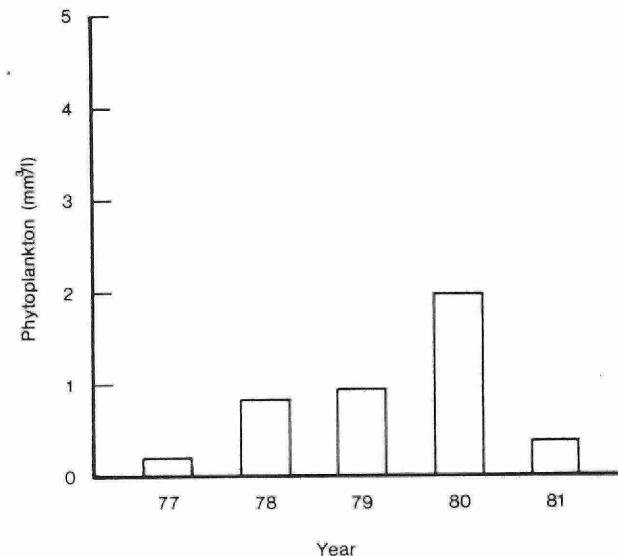
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

12. EUGENIA LAKE



Chlorophyll a - Secchi disc curve.



Phytoplankton cell volumes.

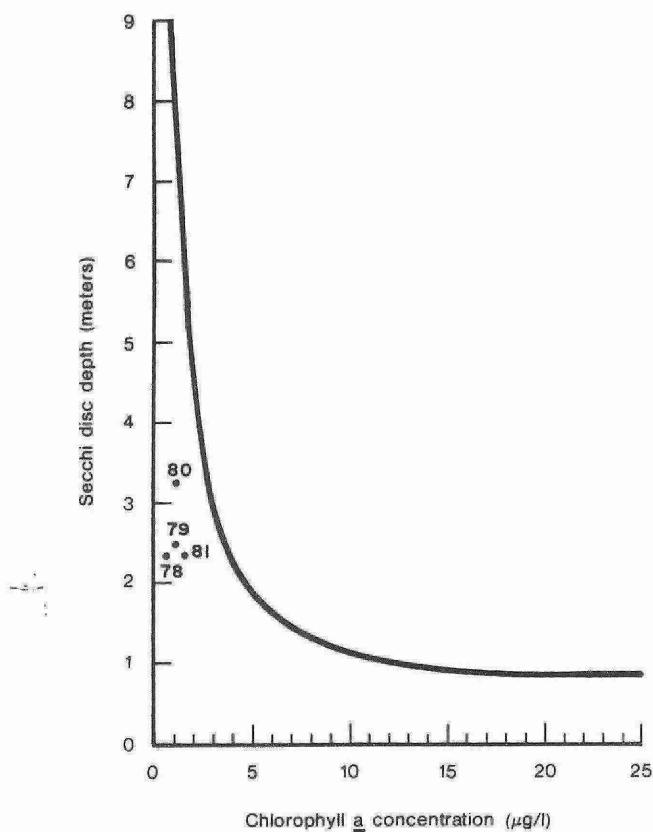
Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	T	3.9	0.227	0.009	0.003	3.5	212
	B	--		0.014	0.005	3.5	200
1978	T	4.0	0.827	0.01	0.002	3.9	210
	B	2.6		0.015	0.002	3.7	212
1979	T	3.4	0.934	0.008	0.001	3.9	198
	B	2.3		0.026	0.004	3.9	231
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total	Solids
	0.005	0.300	0.007	0.84	8.36	--	--
1977	0.025	0.455	0.005	0.86	8.21	--	--
	0.028	0.391	0.005	0.4	8.53	223	2.0
1978	0.032	0.429	0.005	0.4	8.49	--	--
	0.033	0.37	0.003	0.21	8.37	224	< 5.0
1979	0.577	1.02	0.005	0.20	7.74	270	6.0
Alkalinity							
Year	as CaCO <sub>3</sub>	Turbidity	Iron	Calcium	Sodium	Magnesium	
	187	FTU**	0.04	--	--	--	
1977	186	--	0.08	--	--	--	
	195	0.76	0.062	49.8	1.9	20.6	
1978	196	1.32	0.122	50.0	1.8	20.6	
	185	--	0.12	40.4	2.3	23.6	
1979	227	--	0.53	52.8	2.4	24.2	

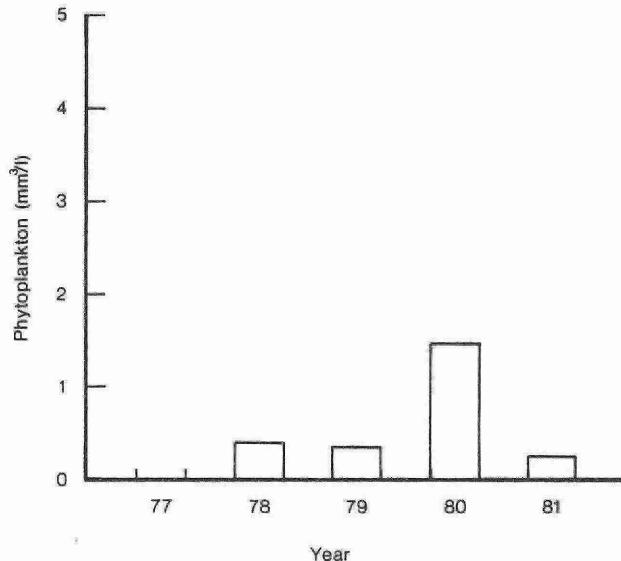
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

13. FRANCIS LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

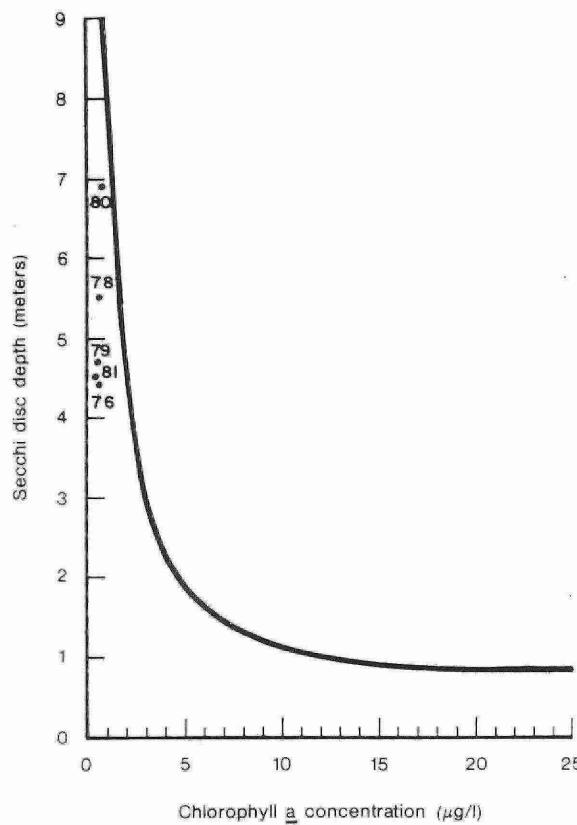
Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	--	--	--	--	--	--	--
1978	2.9	0.95	0.458	0.008	0.002	2.0	184
1979	2.6	1.2	0.427	0.010	0.001	2.3	164
Year	Nitrogen				pH		Solids
	Free ammonia	Kjeldahl	Nitrite	Nitrate	(no units)	Total	Suspended
1977	--	--	--	--	--	--	--
1978	0.028	0.358	0.005	0.362	8.45	216	3.5
1979	0.031	0.38	0.001	0.03	8.62	205	<5.0
Year	Alkalinity	Turbidity		Iron	Calcium	Sodium	Magnesium
	as CaCO <sub>3</sub>	FTU**					
1977	--	--	--	--	--	--	--
1978	184	0.75		0.025	42.5	0.9	21.6
1979	143	--		0.07	25.1	1.0	22.6

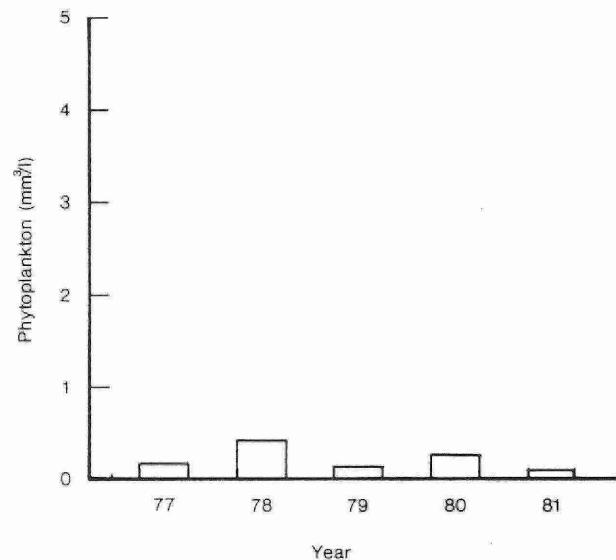
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

## 14. GILLIES LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

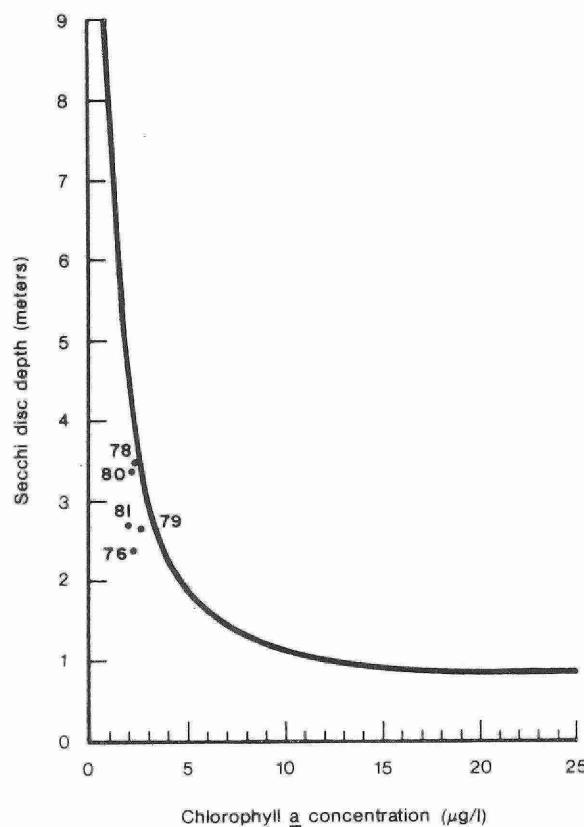
## Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a ( $\mu\text{g/l}$ )	Phytoplankton volume (mm <sup>3</sup> /l)	Total Phosphorus	Soluble Phosphorus	Chloride as Cl	Hardness as CaCO <sub>3</sub>
1977	T	7.5	0.216	0.015	--	1.0	169
	B	--		0.007	--	1.0	168
1978	T	5.6	0.465	0.004	0.001	0.7	162
	B	0.9		0.009	0.001	0.7	176
1979	T	4.6	0.202	0.004	0.002	0.7	166
	B	1.0		0.008	0.002	0.8	179
Nitrogens							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total Solids	Suspended
1977	T	0.015	0.845	0.004	0.345	8.47	--
	B	0.03	0.39	0.007	0.06	7.91	--
1978	T	0.03	0.320	0.002	0.04	204	2.5
	B	0.05	0.363	0.004	0.08		2.3
1979	T	0.011	0.33	0.002	0.02	8.52	176
	B	0.030	0.30	0.003	0.12	7.81	181
Alkalinity as CaCO <sub>3</sub>							
Year	Turbidity FTU**		Iron	Calcium	Sodium	Magnesium	
1977	T	150.5	0.03	--	--	--	--
	B	156.0					--
1978	T	--	0.55	32.5	0.4	19.4	
	B	--	0.55	36.3	0.5	20.7	
1979	T	150	0.03	30.9	0.5	21.6	
	B	160		36.3	0.6	21.5	

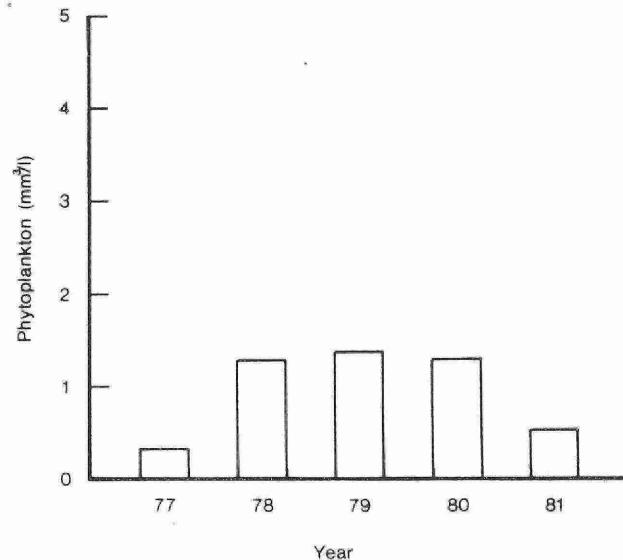
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

15. GOULD LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

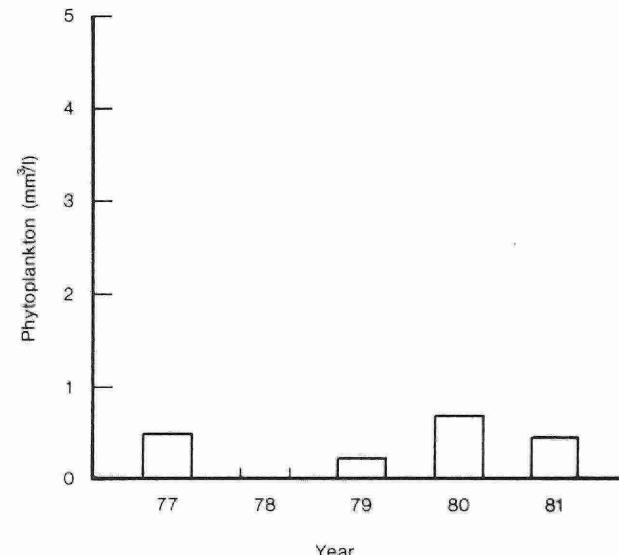
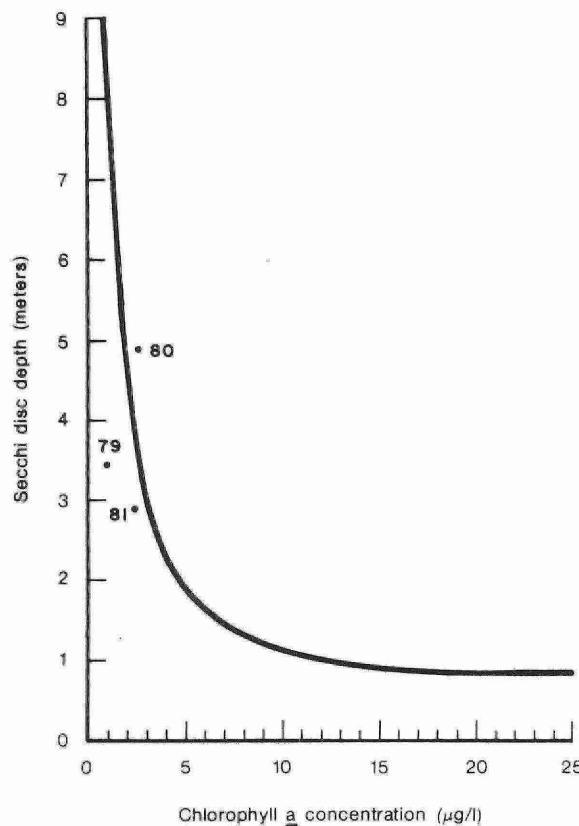
Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	T	3.0	0.391	0.012	0.002	5.47	152
	B	—		0.014	0.002	5.43	154.5
1978	T	3.3	1.368	0.014	0.001	4.8	134.5
	B	2.2		0.021	0.002	5.0	137.7
1979	T	2.7	1.405	0.012	0.003	4.8	149
	B	2.8		0.010	0.001	4.8	157
Year	Nitrogen				pH	Solids	
	Free ammonia	Kjeldahl	Nitrite	Nitrate	(no units)	Total	Suspended
1977	T	0.030	0.569	0.001	0.021	8.42	—
	B	0.060	0.621	0.001	0.021	8.21	—
1978	T	0.030	0.468	0.002	0.04	—	164
	B	0.125	0.627	0.004	0.03	—	169
1979	T	0.037	0.51	0.001	0.01	8.42	177
	B	0.078	0.51	0.001	0.01	8.10	179
Year	Alkalinity		Turbidity	Iron	Calcium	Sodium	Magnesium
	as CaCO <sub>3</sub>	FTU**	FTU**	Iron	Calcium	Sodium	Magnesium
1977	T	133.7	—	0.035	—	—	—
	B	138.5		0.035	—	—	—
1978	T	—	1.0	0.19	36.0	2.1	16.5
	B	—	1.2	0.09	38.7	2.4	16.4
1979	T	133	—	0.04	32.1	2.2	16.9
	B	140		0.06	34.9	2.1	17.1

\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

## 16. IRISH LAKE



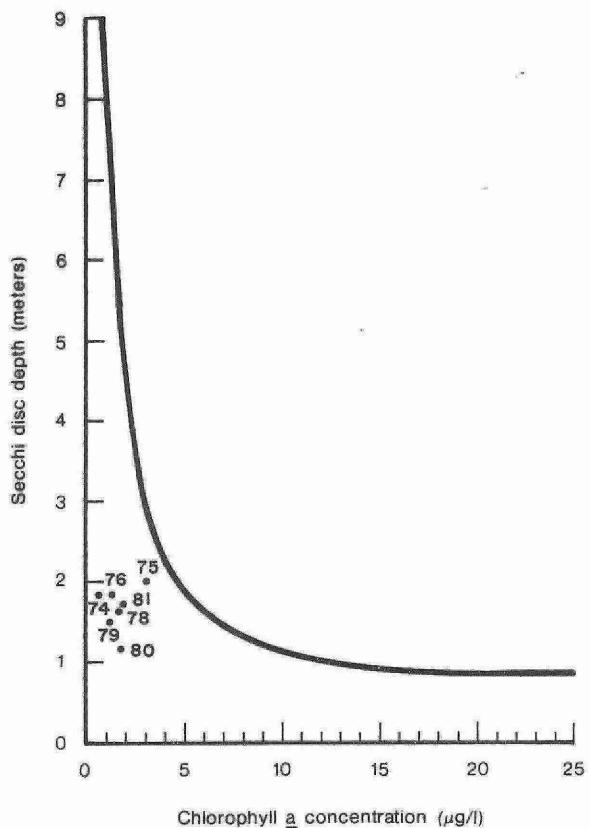
## Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977 T	4.6	--	0.631	0.013	0.003	1.0	92
1977 B						1.0	100
1978 T	--	--	--	--	--	--	--
1978 B						--	--
1979 T	3.4	1.6	0.381	0.013	0.003	1.2	95
1979 B						1.1	93
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total	Solids
1977 T	0.315	0.905	0.005	0.08	8.13	--	--
1977 B	0.340	0.785	0.006	0.08	7.94	--	--
1978 T	--	--	--	--	--	--	--
1978 B						--	--
1979 T	0.024	0.45	0.001	0.02	8.58	112	<5.0
1979 B	0.033	0.50	0.001	0.01	8.59	114	<5.0
Alkalinity							
Year	as CaCO <sub>3</sub>	Turbidity		Iron	Calcium	Sodium	Magnesium
1977 T	87.4	--	FTU**	0.08			
1977 B	86.2			0.30			
1978 T	--	--	--	--	--	--	--
1978 B							
1979 T	85.5	--	FTU**	0.05	21.8	0.73	9.8
1979 B	85.9			0.07	21.4	0.47	9.6

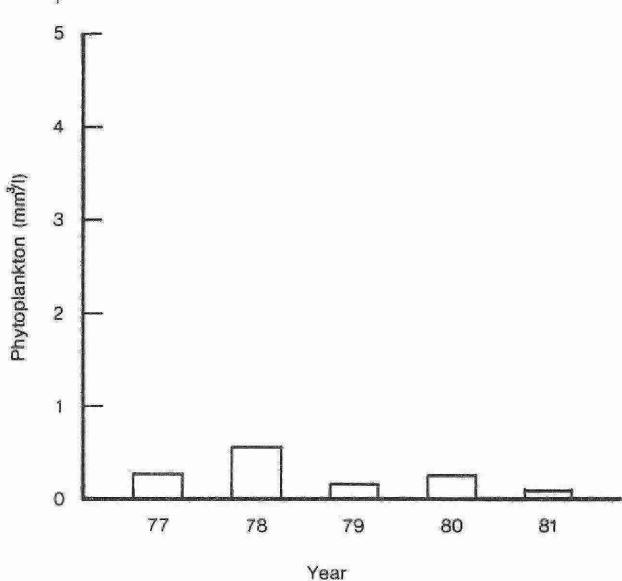
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

17. ISAAC LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

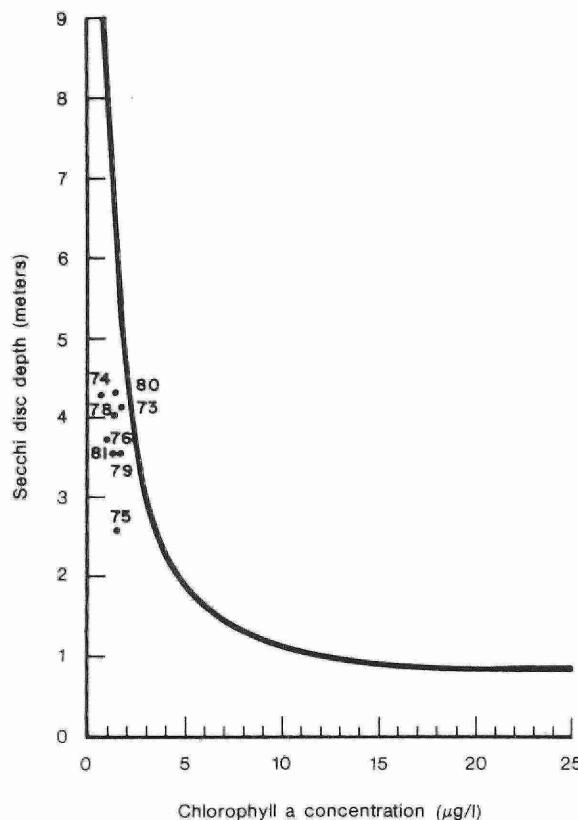
Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a (ug/l)	Phytoplankton volume (mm³/l)	Phosphorus Total	Phosphorus Soluble	Chloride as Cl	Hardness as CaCO <sub>3</sub>
1977	1.5	--	0.309	0.021	0.006	3.0	152
1978	1.7	1.7	0.574	0.01	0.001	2.9	161
1979	1.5	1.4	0.230	0.012	0.001	3.0	170
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total Solids	Suspended
1977	0.045	0.495	0.005	< 0.01	8.09	--	--
1978	0.031	0.525	0.002	0.01	8.36	186	2.5
1979	0.020	0.530	0.001	0.01	8.34	189	5.0
Alkalinity							
Year	as CaCO <sub>3</sub>	Turbidity	Iron	Calcium	Sodium	Magnesium	
1977	129	--	0.06	--	--	--	
1978	151	1.04	0.05	38.2	1.1	15.8	
1979	154	--	0.08	36.9	1.5	18.9	

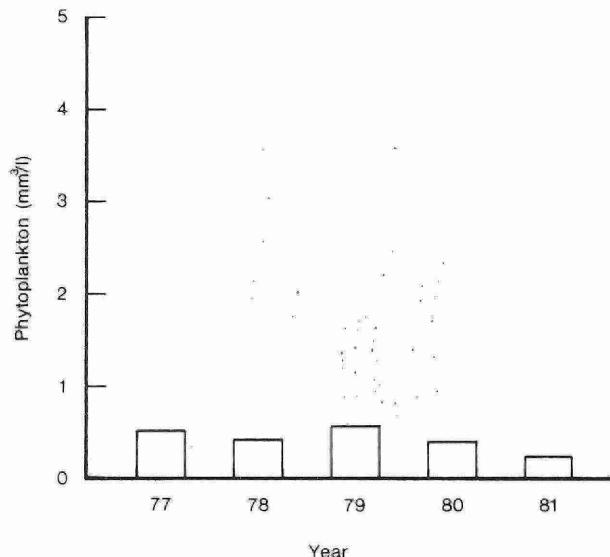
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

18. McCULLOUGH LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

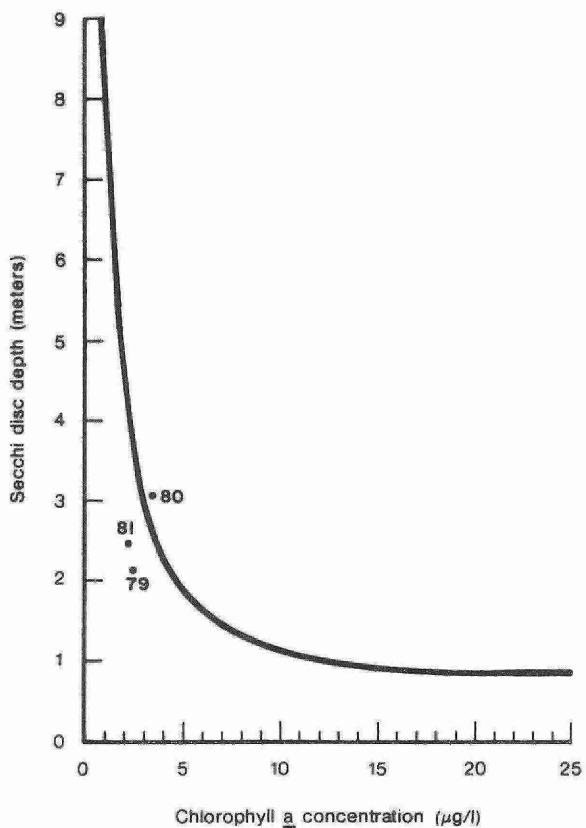
Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	T	3.7	0.501	0.008	0.001	3.6	231.3
	B	—		0.016	0.002	3.9	221.3
1978	T	4.0	0.487	0.006	0.001	3.4	231
	B	1.3		0.009	0.002	3.9	235
1979	T	3.6	0.542	0.005	0.002	3.6	238
	B	1.8		0.008	0.003	3.6	231
Year	Nitrogen				pH	Solids	
	Free ammonia	Kjeldahl	Nitrite	Nitrate	(no units)	Total	Suspended
1977	T	0.019	0.318	0.004	0.40	8.38	—
	B	0.028	0.352	0.035	0.55	7.83	—
1978	T	0.021	0.279	0.004	0.47	8.33	260
	B	0.021	0.294	0.004	0.68	8.41	0.7
1979	T	0.016	0.26	0.003	0.53	8.38	249
	B	0.020	0.26	0.009	0.63	7.72	4.5
Year	Alkalinity	Turbidity		Iron	Calcium	Sodium	Magnesium
	as CaCO <sub>3</sub>	FTU**	—	—	—	—	—
1977	T	218.3	—	0.038	—	—	—
	B	210.8	—	0.080	—	—	—
1978	T	215	1.18	0.056	52.7	1.93	24.1
	B	215	1.67	0.09	55.0	2.03	23.8
1979	T	224	—	0.04	53.4	2.0	25.4
	B	214	—	0.13	54.2	2.0	23.1

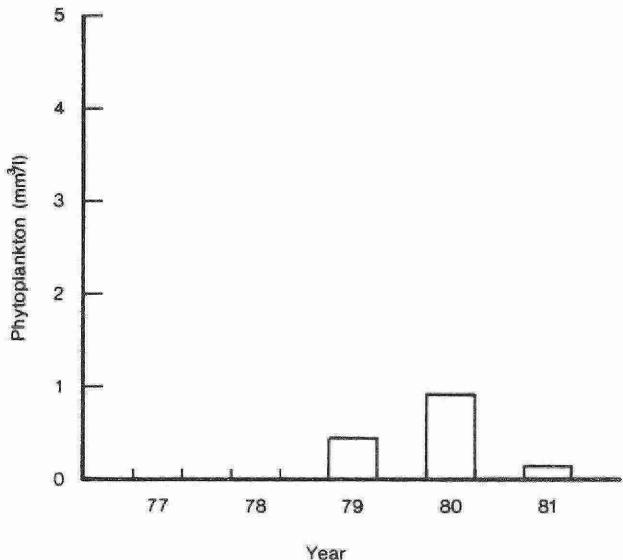
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

19. MCGILL LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

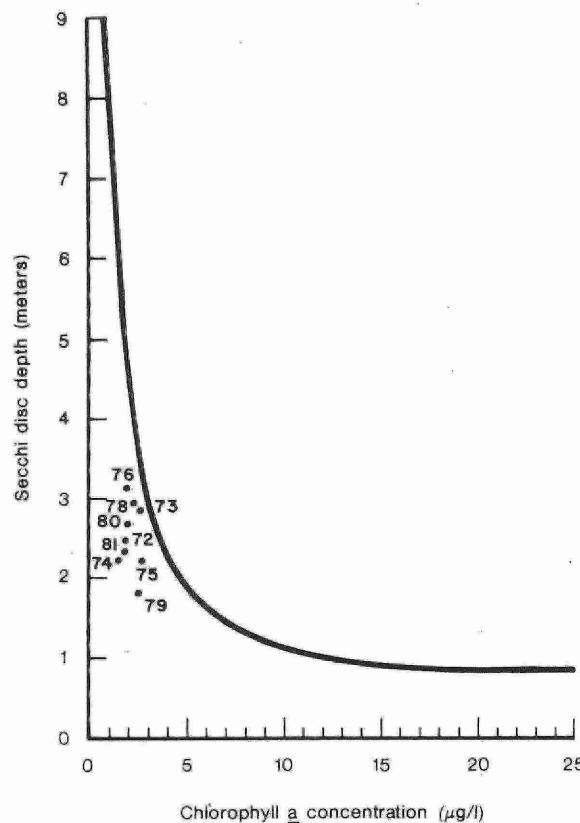
Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a ( $\mu\text{g/l}$ )	Phytoplankton volume ( $\text{mm}^3/\text{l}$ )	Phosphorus Total	Phosphorus Soluble	Chloride as Cl	Hardness as $\text{CaCO}_3$
1977 T	--	--	--	--	--	--	--
1978 T	--	--	--	--	--	--	--
1979 T	2.1	2.7	.378	0.014	0.001	1.5	199
1979 B				0.029	0.005	2.0	196
Year	Nitrogen				pH (no units)	Solids	
	Free ammonia	Kjeldahl	Nitrite	Nitrate		Total	Suspended
1977 T	--	--	--	--	--	--	--
1978 T	--	--	--	--	--	--	--
1979 T	0.013	0.39	0.001	0.01	8.34	236	L5.0
1979 B	0.052	0.50	0.001	0.01	7.76	227	L5.0
Year	Alkalinity as $\text{CaCO}_3$	Turbidity FTU**		Iron	Calcium	Sodium	Magnesium
1977 T	--	--	--	--	--	--	--
1978 T	--	--	--	--	--	--	--
1979 T	188	--	0.04	47.5	1.1	19.7	
1979 B	184	--	0.08	47.2	1.4	18.9	

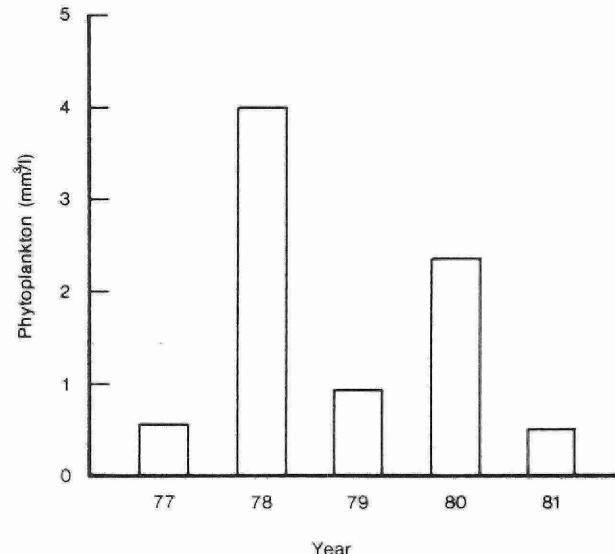
\*Note - All values in  $\text{mg/l}$  except where otherwise indicated

\*\*Formazin Turbidity Units

20. MILLER LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

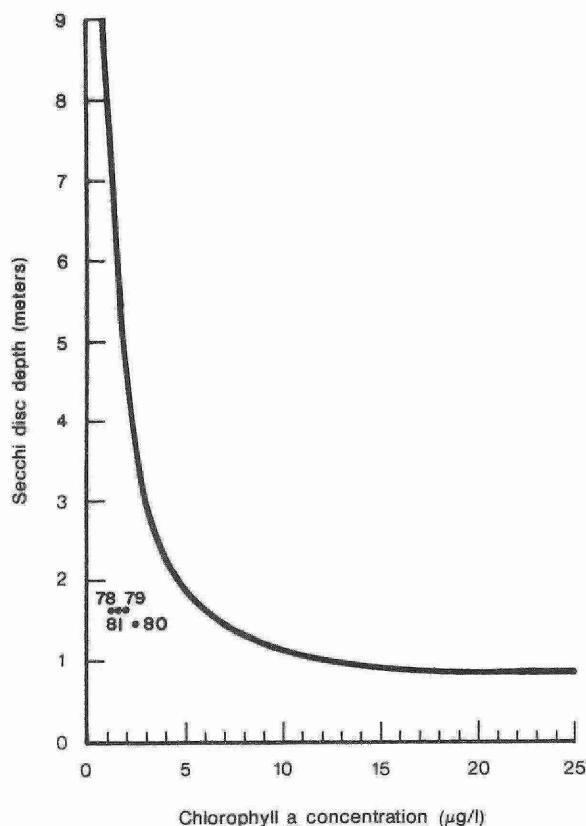
Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a ( $\mu\text{g/l}$ )	volume ( $\text{mm}^3/\text{l}$ )	Total	Soluble	as Cl	as $\text{CaCO}_3$
1977	T	2.6	0.592	0.010	0.003	1.28	155
	B	--		0.013	0.002	1.28	155
1978	T	2.9	4.153	0.006	0.001	1.6	192
	B	2.3		0.010	0.001	1.7	209
1979	T	1.8	1.066	0.010	0.002	1.4	165
	B	2.5		0.008	0.001	1.5	167
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total	Solids
1977	T	0.023	0.481	0.001	0.022	8.43	--
	B	0.035	0.530	0.001	0.019	8.43	--
1978	T	0.024	0.400	0.003	0.06	8.60	178
	B	0.028	0.432	0.003	0.08	8.58	
1979	T	0.024	0.50	0.001	0.01	8.40	178
	B	0.021	0.42	0.001	0.01	8.41	< 5.0
Alkalinity							
Year	as $\text{CaCO}_3$	Turbidity	Iron	Calcium	Sodium	Magnesium	
1977	T	140	0.038	--	--	--	--
	B	141		0.054	--	--	--
1978	T	149	1.20	0.04	90.6	8.4	36.9
	B	148		0.05	103.0	9.9	42.0
1979	T	150	0.03	34.8	0.6	19.0	
	B	151		35.1	0.6	19.2	

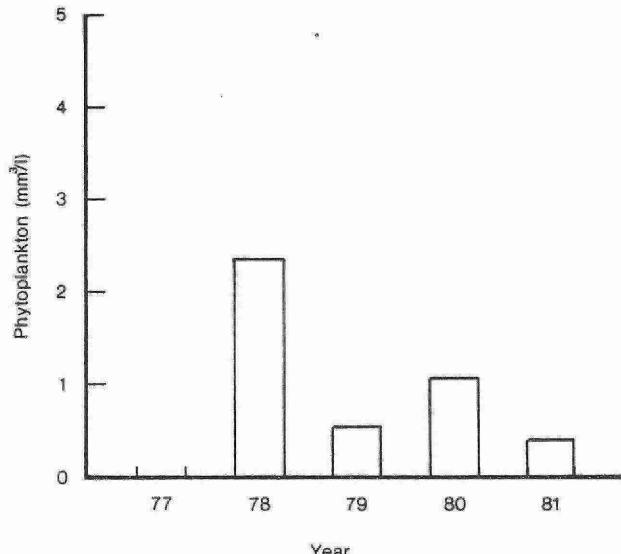
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

21. MOUNTAIN LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

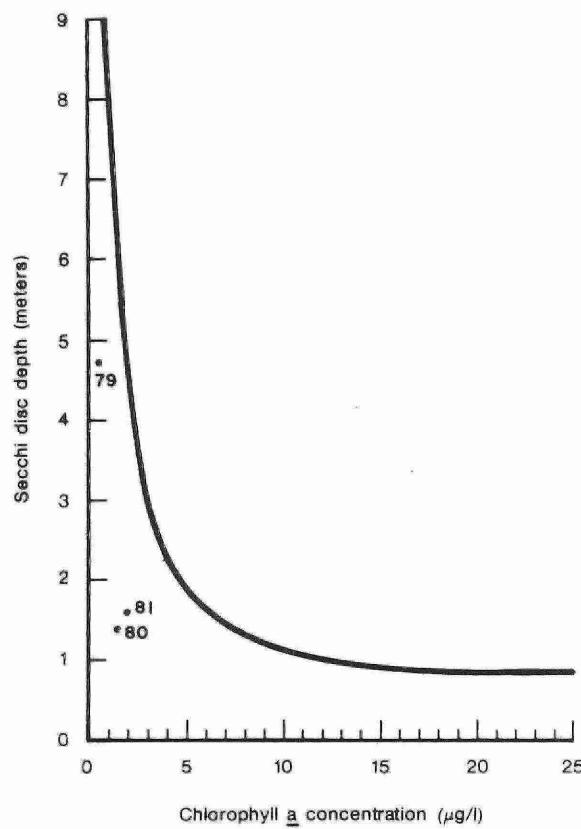
Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a ( $\mu\text{g/l}$ )	Phytoplankton volume ( $\text{mm}^3/\text{l}$ )	Total Phosphorus	Soluble Phosphorus	Chloride as $\text{Cl}$	Hardness as $\text{CaCO}_3$
1977	--	--	--	--	--	--	--
1978	1.7	1.4	2.471	0.010	0.002	2.2	168
1979	1.7	1.9	0.567	0.018	< 0.001	2.3	158
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total Solids	Suspended Solids
1977	--	--	--	--	--	--	--
1978	0.038	0.574	0.003	0.04	8.41	177	4.2
1979	0.036	0.69	0.001	0.01	8.69	177	< 5.0
Alkalinity as $\text{CaCO}_3$							
Year	Turbidity FTU**	Iron	Calcium	Sodium	Magnesium		
1977	--	--	--	--	--	--	--
1978	156	1.14	39.5	0.95	16.8		
1979	137	--	27.8	1.4	21.5		

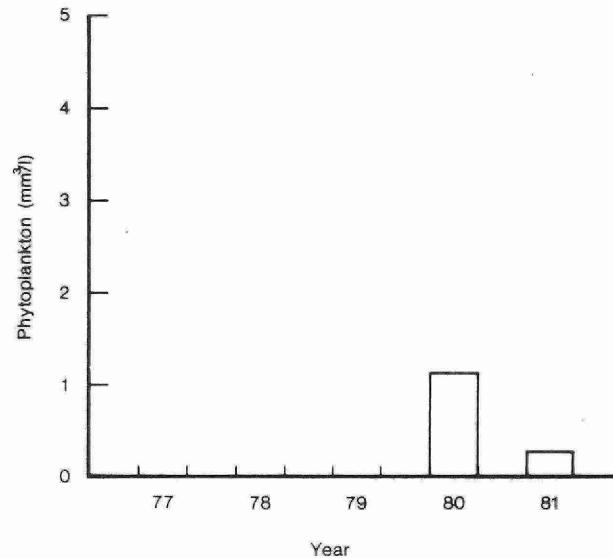
\*Note - All values in  $\text{mg/l}$  except where otherwise indicated

\*\*Formazin Turbidity Units

22. SHEPARD LAKE



Chlorophyll a-Secchi disc curve.



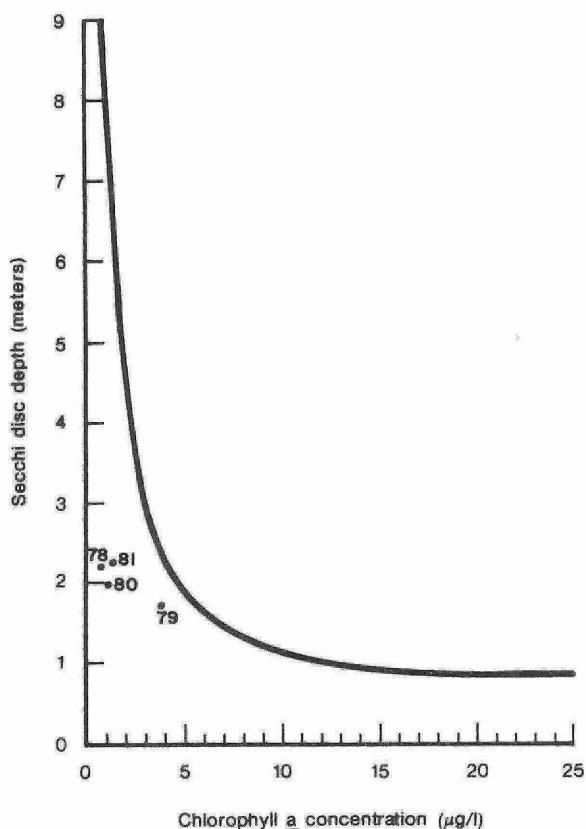
Phytoplankton cell volumes.

Average values for water quality parameters

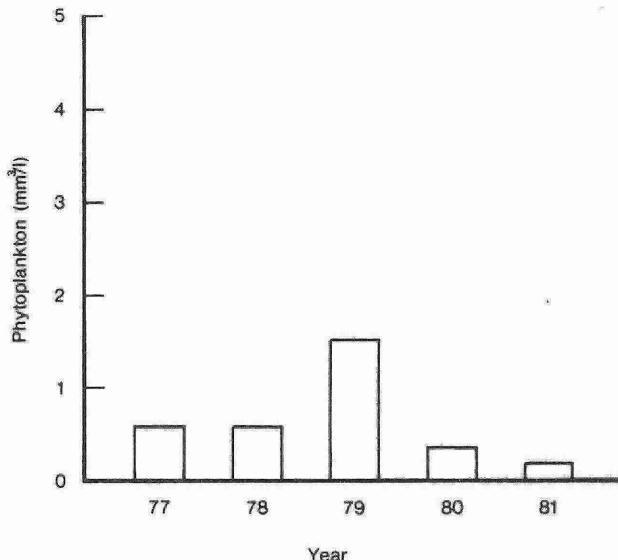
Year	Secchi disc (m)	Chlorophyll a ( $\mu\text{g/l}$ )	Phytoplankton volume ( $\text{mm}^3/\text{l}$ )	Total Phosphorus	Soluble Phosphorus	Chloride as Cl	Hardness as $\text{CaCO}_3$
1977 T	--	--	--	--	--	--	--
1978 T	--	--	--	--	--	--	--
1979 T	4.8	0.7	--	0.007	0.001	1.5	213
1979 B			--	0.005	0.001	1.5	200
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total Solids	Suspended Solids
1977 T	--	--	--	--	--	--	--
1978 T	--	--	--	--	--	--	--
1979 T	0.063	0.43	0.002	0.25	8.15	245	15.0
1979 B	0.090	0.58	0.002	0.11	8.26	246	15.0
Year	Alkalinity as $\text{CaCO}_3$	Turbidity FTU**	Iron	Calcium	Sodium	Magnesium	
1977 T	--	--	--	--	--	--	--
1978 T	--	--	--	--	--	--	--
1979 T	195	--	0.02	42.8	1.3	25.7	
1979 B	181	--	0.06	35.0	1.2	27.2	

\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

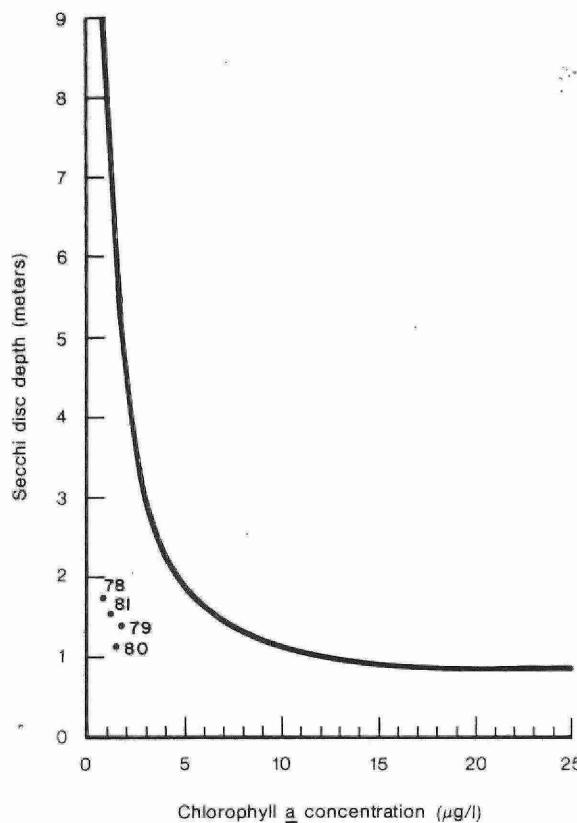
Average values for water quality parameters

Year	Secchi	Chlorophyll	Phytoplankton	Phosphorus		Chloride	Hardness
	disc (m)	a (ug/l)	volume (mm³/l)	Total	Soluble	as Cl	as CaCO <sub>3</sub>
1977	4.0	--	0.681	0.013	0.003	1.0	142
1978	2.2	0.9	0.681	0.008	0.002	0.7	160
1979	1.7	4.1	1.687	0.008	0.002	1.0	152
Year	Nitrogen				pH	Solids	
	Free ammonia	Kjeldahl	Nitrite	Nitrate	(no units)	Total	Suspended
1977	0.018	0.583	0.002	0.01	8.7	--	--
1978	0.055	0.490	0.002	0.02	--	192	28.5
1979	0.022	0.560	0.001	0.01	8.53	170	< 5.0
Year	Alkalinity	Turbidity		Iron	Calcium	Sodium	Magnesium
	as CaCO <sub>3</sub>	FTU**					
1977	130.5	--		0.025	--	--	--
1978	--	0.85		0.02	31.0	0.4	19.7
1979	138	--		0.06	24.1	0.5	22.3

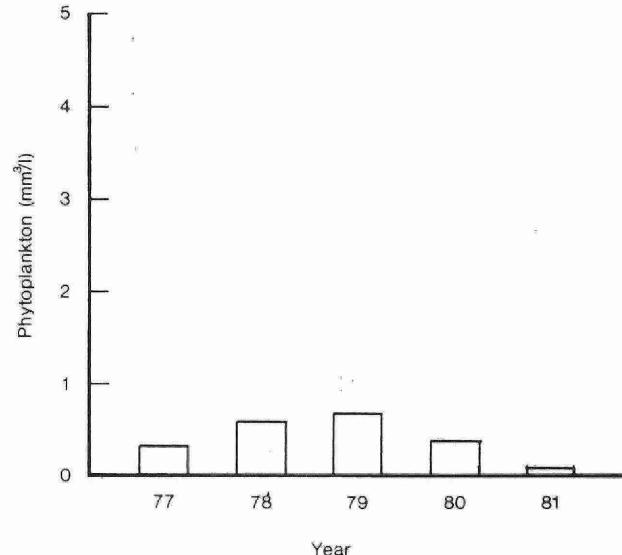
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

24. SILVER LAKE



Chlorophyll a-Secchi disc curve.



Phytoplankton cell volumes.

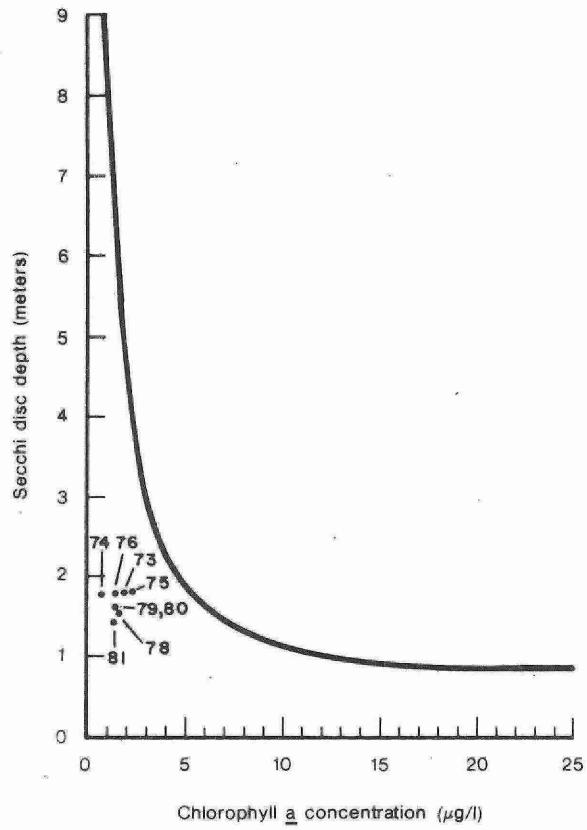
Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a ( $\mu\text{g/l}$ )	Phytoplankton volume ( $\text{mm}^3/\text{l}$ )	Phosphorus Total	Phosphorus Soluble	Chloride as Cl	Hardness as $\text{CaCO}_3$
1977	--	--	0.265	0.016	< 0.001	2.0	--
1978	1.7	1.2	0.632	0.014	0.002	2.0	164
1979	1.5	1.9	0.725	0.013	0.001	2.4	168
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total Solids	Suspended
1977	0.025	0.585	0.001	< 0.01	--	--	--
1978	0.04	0.554	0.002	< 0.01	8.36	194	2.0
1979	0.041	0.620	0.001	0.01	8.38	191	5.5
Alkalinity							
Year	as $\text{CaCO}_3$	Turbidity FTU**	Iron	Calcium	Sodium	Magnesium	
1977	135	--	0.09	--	--	--	
1978	164	1.19	0.13	41.3	0.8	15.0	
1979	142	--	0.08	38.0	1.1	17.7	

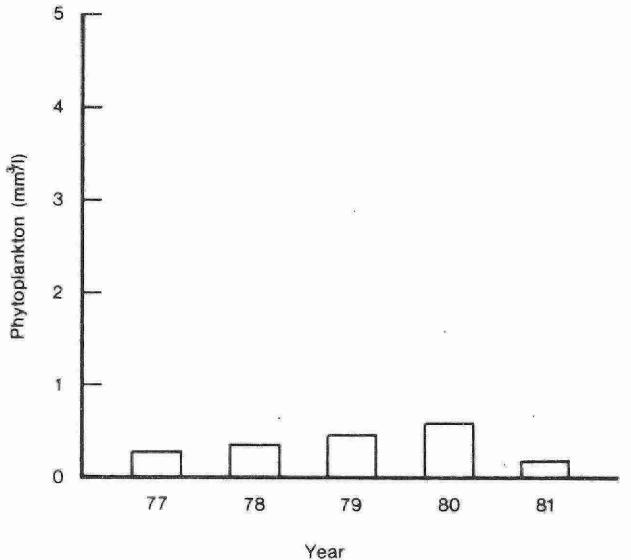
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

25. SKY LAKE



Chlorophyll a-Secchi disc curve.



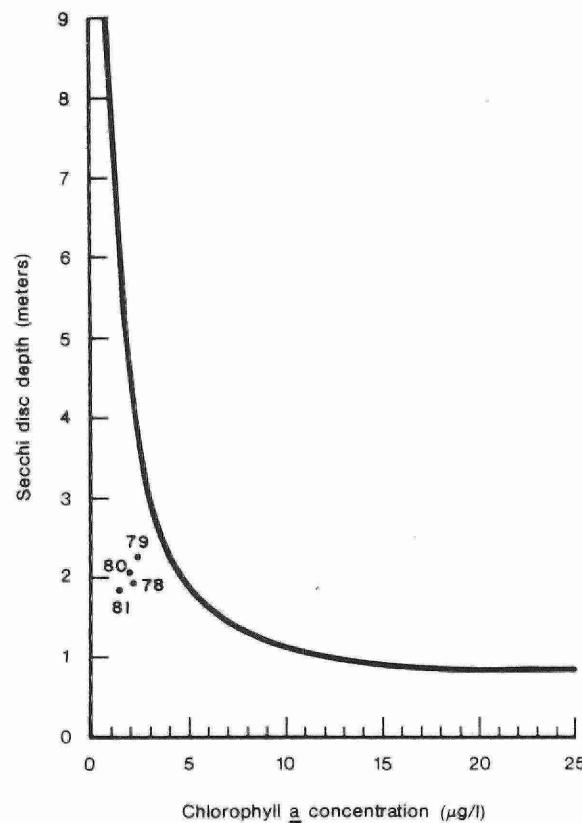
Phytoplankton cell volumes.

Average values for water quality parameters

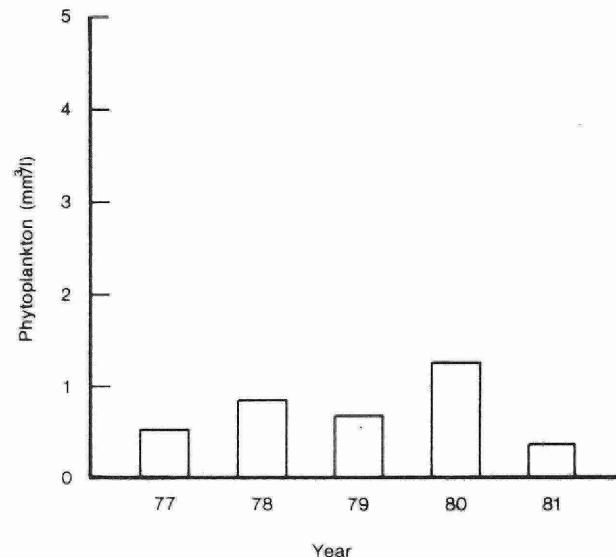
Year	Secchi disc (m)	Chlorophyll a (ug/l)	Phytoplankton volume (mm³/l)	Total Phosphorus	Soluble Phosphorus	Chloride as Cl	Hardness as CaCO <sub>3</sub>
1977	0.9	—	0.285	0.014	0.002	2.6	162
1978	1.7	1.9	0.459	0.016	0.006	2.3	163
1979	1.7	1.8	0.519	0.024	0.001	2.8	169
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total Solids	Suspended Solids
1977	0.025	0.625	0.001	0.01	8.47	—	—
1978	0.024	0.495	0.002	< 0.01	8.38	186	1.5
1979	0.016	0.59	0.001	< 0.01	8.54	213	5.0
Alkalinity							
Year	as CaCO <sub>3</sub>	Turbidity	FTU**	Iron	Calcium	Sodium	Magnesium
1977	147.9	—	—	0.067	—	—	—
1978	156	—	1.31	0.07	37.7	1.1	16.8
1979	158	—	—	0.07	33.4	1.8	20.8

\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units



Chlorophyll a - Secchi disc curve.



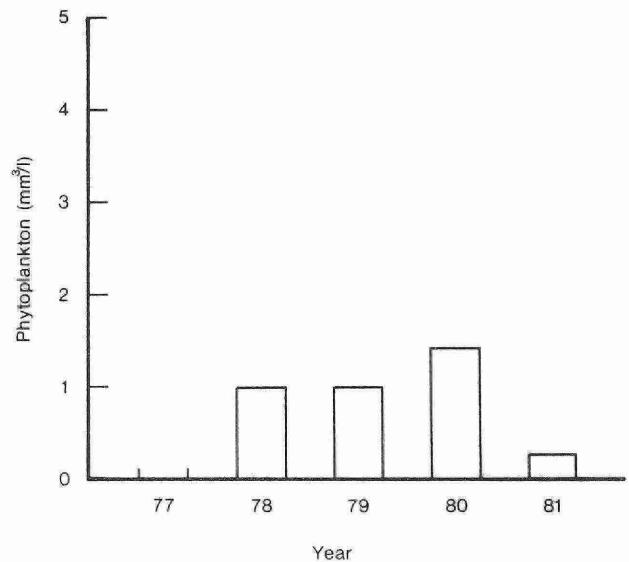
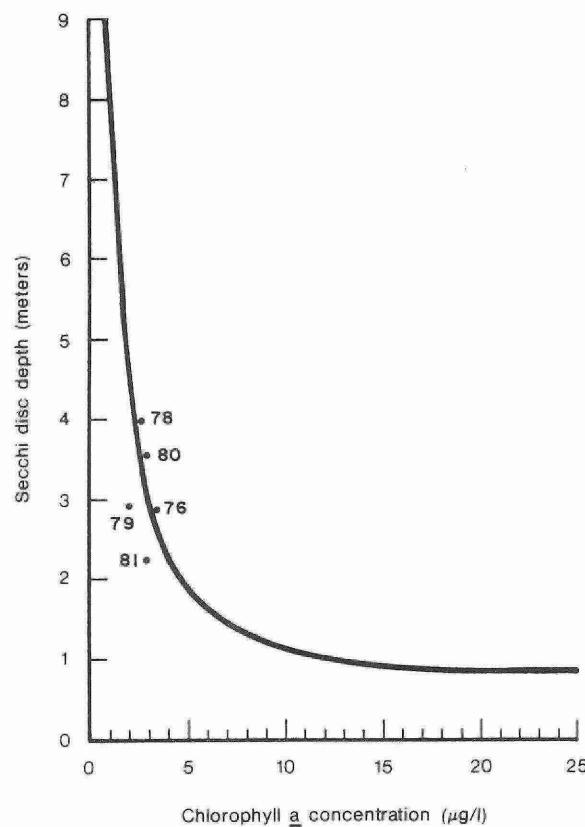
Phytoplankton cell volumes.

Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a ( $\mu\text{g/l}$ )	Phytoplankton volume ( $\text{mm}^3/\text{l}$ )	Total Phosphorus	Soluble Phosphorus	Chloride as Cl	Hardness as $\text{CaCO}_3$
1977	1.2	—	0.620	0.014	0.003	4.73	110
1978	1.8	1.45	0.939	0.011	0.001	4.7	106
1979	2.4	2.5	0.695	0.009	0.001	5.1	120
Nitrogen							
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	pH (no units)	Total Solids	Suspended Solids
1977	0.086	0.76	0.002	0.02	8.45	—	—
1978	0.139	0.79	0.003	0.04	9.0	134	2
1979	0.034	0.61	0.001	0.01	8.50	145	< 5.0
Alkalinity as $\text{CaCO}_3$							
Year		Turbidity FTU**		Iron	Calcium	Sodium	Magnesium
1977	99	—		0.05	—	—	—
1978	88	1.27		0.07	29.8	2.2	8.8
1979	100	—		0.08	30.6	2.7	10.6

\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units



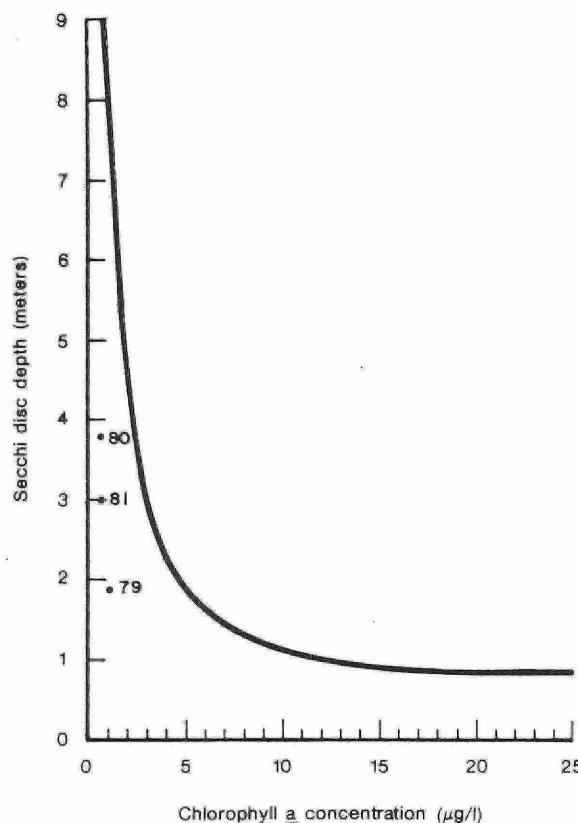
Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a (ug/l)	Phytoplankton volume (mm³/l)	Phosphorus		Chloride as Cl	Hardness as CaCO <sub>3</sub>		
				Total	Soluble				
1977	T	3.6	--	0.017	0.005	8.0	180		
	B	—							
1978	T	4.0	2.9	1.073	0.012	4.9	183		
	B	—							
1979	T	2.9	2.3	1.120	0.011	4.8	205		
	B	—							
Nitrogen									
Year	Free ammonia			pH (no units)	Solids				
	Kjeldahl	Nitrite	Nitrate		Total	Suspended			
1977	T	0.025	0.365	0.005	0.10	8.17	—		
	B	0.025	0.425	0.007	0.12	8.16	—		
1978	T	0.018	0.40	0.001	0.01	8.48	—		
	B	0.018	0.426	0.002	0.01	8.49	—		
1979	T	0.023	0.37	0.001	0.01	8.48	219 <5.0		
	B	0.021	0.42	0.001	0.01	8.45	218 <5.0		
Alkalinity as CaCO <sub>3</sub>									
Year	Turbidity FTU**		Iron	Calcium	Sodium	Magnesium			
	as CaCO <sub>3</sub>	FTU**	Iron	Calcium	Sodium	Magnesium			
1977	T	166	—	0.08	—	—	—		
	B	170	—	0.06	—	—	—		
1978	T	180	0.92	0.04	40.5	—	19.8		
	B	180	1.10	0.04	40.5	—	19.2		
1979	T	181	—	0.05	45.3	3.1	20.4		
	B	181	—	0.09	44.3	3.3	21.2		

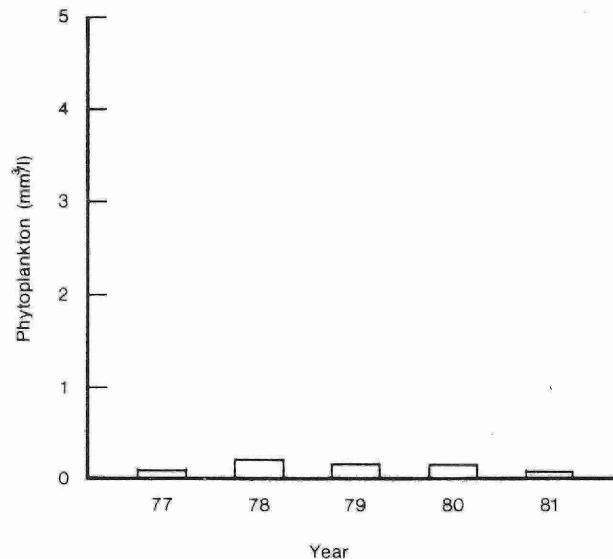
\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units

27. WILCOX LAKE



Chlorophyll a-Secchi disc curve.



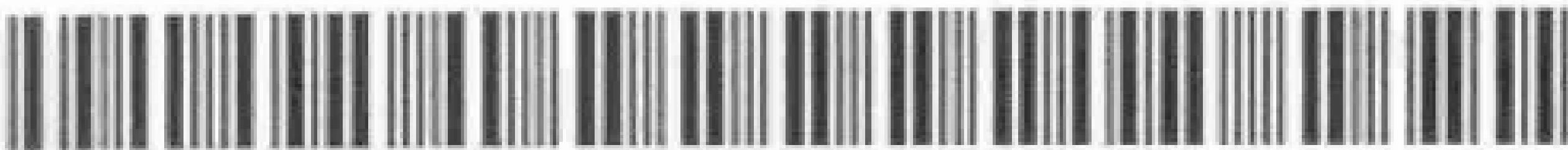
Phytoplankton cell volumes.

Average values for water quality parameters

Year	Secchi disc (m)	Chlorophyll a (ug/l)	Phytoplankton volume (mm³/l)	Phosphorus	Chloride as Cl	Hardness as CaCO <sub>3</sub>
				Total	Soluble	
1977 T	2.1	--	0.075	0.006	0.001	216
B				0.016	0.002	214
1978 T	--	--	0.226	--	--	--
B						
1979 T	1.9	1.1	0.140	0.004	0.001	208
B				0.007	0.001	212
	Nitrogen				pH	Solids
Year	Free ammonia	Kjeldahl	Nitrite	Nitrate	(no units)	Total
1977 T	0.075	0.42	0.007	0.31	8.28	--
B	0.07	0.46	0.006	0.31	8.22	--
1978 T	--	--	--	--	--	--
B						
1979 T	0.048	0.32	0.003	0.17	8.31	253
B	0.050	0.34	0.003	0.16	8.34	246
	Alkalinity as CaCO <sub>3</sub>		Turbidity FTU**		Iron	Calcium
Year						Sodium
1977 T	200		--	0.033	--	--
B	201		--	0.063	--	--
1978 T	--	--	--	--	--	--
B						
1979 T	189		--	0.04	44.8	7.1
B	190		--	0.05	45.3	7.4

\*Note - All values in mg/l except where otherwise indicated

\*\*Formazin Turbidity Units



\*9693600009307\*